SIEMENS

SIOS

SP

System

Start-Up Instructions

Siemens Integrated OR System **55 37 027**

From Software Version VA 00C

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Document revision level

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Page

1 Definitions, Acronyms and Abbreviations 1 - 1

Abbreviations . . . 1 - 1
Definitions . . . 1 - 3
. . . 1 - 3

2 General Information 2 - 1

Implementation and quality of start-up . . . 2 - 1
Tools, measurement devices, and auxiliary materials required . . . 2 - 1
Documentation required . . . 2 - 2
Time and personnel requirements . . . 2 - 3
Start-Up Protocol . . . 2 - 3
Ground connections . . . 2 - 3
Maintenance and service . . . 2 - 3
Technical data . . . 2 - 4
Safety information and protective measures . . . 2 - 4
Product-specific safety measures . . . 2 - 4

3 System Overview 3 - 1

Component positions inside the documentation unit . . . 3 - 3
Component positions inside the central control unit . . . 3 - 4
SIOS PC connections . . . 3 - 6
Component positions inside the device box . . . 3 - 8
Device box - functional components . . . 3 - 9
Supply to device box . . . 3 - 11
Component positions in the monitor unit . . . 3 - 12
Hand input device (HBT) . . . 3 - 13
Keyboard . . . 3 - 13
Modem . . . 3 - 15

4 Preparations 4 - 1

Preliminary steps . . . 4 - 1
Installation completion checks . . . 4 - 2
Isolated installation test . . . 4 - 2
Maintenance positions and identification . . . 4 - 3
. . . 4 - 3
DIP switch settings . . . 4 - 4
Performing the initial start-up . . . 4 - 5
System operation test . . . 4 - 7
Completion of function test . . . 4 - 8
Mechanical check . . . 4 - 8
Visual inspection . . . 4 - 8
Protective conductor measurement . . . 4 - 9

Page

Installation completion . . . . . 4 - 9

5 Start-Up 5 - 1

Switching on the system . . . . . 5 - 1
Status check . . . . . 5 - 2
Checking the RS232 interface . . . . . 5 - 3
Checking the CAN interface . . . . . 5 - 4
Checking the video path . . . . . 5 - 5
Basic video printer settings . . . . . 5 - 7
Configuration . . . . . 5 - 11
SW configuration - initial steps . . . . . 5 - 11
Setting the volume . . . . . 5 - 12
Deactivating ClearKey . . . . . 5 - 14
Restarting SIOS . . . . . 5 - 15
Keyboard configuration . . . . . 5 - 16
User language configuration . . . . . 5 - 17
Telephone configuration . . . . . 5 - 19
Pager configuration . . . . . 5 - 20
Voice control configuration . . . . . 5 - 21
OR table(s) configuration . . . . . 5 - 22
Roomlight / OR light configuration . . . . . 5 - 22
Light control configuration (hardware) . . . . . 5 - 24
Checking menu functions . . . . . 5 - 25
Videomixer . . . . . 5 - 27
Endo light (Wolf Co.) . . . . . 5 - 28
Endo camera (Wolf Co.) . . . . . 5 - 29
ESU (Berchtold Co.) . . . . . 5 - 30
OR table (Trumpf Jupiter Co.) . . . . . 5 - 31
X-ray system (Siemens Siremobil ISO-C) . . . . . 5 - 32
Ultrasound system (Siemens Sonoline Sienna) . . . . . 5 - 33
Video recorder . . . . . 5 - 34
Video printer . . . . . 5 - 35
Testing the voice control . . . . . 5 - 36
Telephone . . . . . 5 - 37
Pager . . . . . 5 - 38

6 Saving the Configuration 6 - 1

Creating a backup disk . . . . . 6 - 1
Creating the backup . . . . . 6 - 2
Saving control menus (ccf files) . . . . . 6 - 3
Saving the software configuration (registry) . . . . . 6 - 5
Saving speaker data . . . . . 6 - 6
Saving the hardware configuration . . . . . 6 - 7

Page

7 Data Protection 7 - 1

Data security: . . . . . 7 - 1
Disk protection. . . . . 7 - 1
Data transfer. . . . . 7 - 1
Activating ClearKey . . . . . 7 - 2

8 Safety tests 8 - 1

EMERGENCY STOP test . . . . . 8 - 1
UPS test . . . . . 8 - 1
EMERGENCY OFF test . . . . . 8 - 1

9 Image Quality 9 - 1

Basic settings for TFT image monitors . . . . . 9 - 1
TFT menu monitor settings . . . . . 9 - 2

10 Concluding Steps 10 - 1

Mechanical check . . . . . 10 - 1
Visual inspection . . . . . 10 - 1
Protective conductor measurement . . . . . 10 - 1
Protocol . . . . . 10 - 1
System acceptance . . . . . 10 - 1

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Abbreviations

AAM	Audio Amplifier Module
AE	Receipt of order
BM / VM	Image mixer / video mixer
CAI	Control Audio Interface
CANopen	Communication bus / control interface for external technologies
C-arm	Mobile X-ray system
CG	Surgical gases
CHARM	Change request management system
CMT	Configuration Management Tool
CO_2	Carbon dioxide
CSE	Customer Service Engineer
CS PS	Internal department code (Customer Services Product Support)
DB	Device Box for housing surgical devices
DE	Documentation unit, upper section of cabinet
DIN	German industry standard
DL catalog	Service provider catalog
DU	Display Unit (central image and control unit)
EN	European standard
Endo	Endoscopy
ES	Electronics cabinet, central SIOS control
ES1 / ES2	230 V multipoint connector
HBT	Hand input device
ESU	Electrical surgery unit
HPC board	Name of PC board
IEC	International Electrotechnical Commission
IP	Industry partner
kdb	Knowledge database
Keyboard	Keyboard
LC	Light Control
Mat_No.	Material number (Siemens order number in SAP system - (previously called "Item Number")
Mh	Man hours
Mod	Modality

Modem	Modem
Mouse	Mouse
MPS	Multi Power Supply
OR	Operating room
PET	Product introduction team
PC	Personal Computer
PG	Planning Guide
PI	Pricing Information
PM	Project Manager
PS 12V	12V Power Supply
PSU	Power Supply Unit (main power supply in the electronics cabinet)
RS 232	RS 232 interface distributor (serial interface)
SH	Interface to building technology
SIOS	Siemens Integrated OR System
SIOS PC	SIOS Personal Computer
TFT	Thin Film Transistor
TM	Separation module
USV (**UPS)**	Uninterruptible Power Supply
VCR	Video recorder
VDE	Association for Electrical, Electronic and Information Technologies
VK	Short designation of system cable
VM / BM	Video mixer / image mixer
VP	Video printer
VR P FP	Internal department code
VS	Video Splitter
VR	Video Receiver
VX	Video Multiplexer
WS	Wall column, wall supply unit for Device Box and C-arm system
ZIP	ZIP drive (external)
ZS	Central control, lower section of cabinet

Definitions

Trades	Comprises all crafts and trades involved in completing a project
Worst case	Most unfavorable constellation or situation to be expected
Stand-alone operation	Manual operation of functional modules without SIOS control
IP	Industry partner; manufacturer of functional modules equipped with SIOS interface

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Implementation and quality of start-up

NOTICE	**Start-up of the SIOS system may be performed by authorized personnel only. The authorization requirements are described in the Field Service Strategy (SPR1-130.890.01...)**

p The complete SIOS system does not undergo final inspection following manufacture. The initial system test is performed during start-up after installation at the customer site. All procedures described in this document have to be recorded in the start-up protocol. The initial steps include verifying proper installation and have to be performed upon completion of installation, before signing the installation protocol.

Tools, measurement devices, and auxiliary materials required

NOTICE	**All tools, measurement devices, and auxiliary materials listed can be found in the STC (Service Tools Catalog) except those designated with an asterisk (" * ").**

- Standard tool kit *
- Digital multimeter (e.g. “Fluke 8060A”, mat. no. 97 02 101)
- Protective conductor meter (e.g. “Protective ground wire tester”, mat. no. 44 15 899)
- "White" touch-up paint (e.g. touch-up applicator, mat. no. 34 44 403)
- "Medium Basic" (gray) touch-up paint (e.g. paint spray, mat. no. 40 04 243)
- "Medical Blue" touch-up paint (e.g. touch-up applicator, mat. no. 55 07 087)
- One formatted ZIP disk 250 MB *
- VCR * mat. no. 5143115 (loaner from GG SP/SPL1 if customer did not order SIOS equipped with VCR)
- One video cassette with any color picture information (Europe: VHS / U.S.: PAL) *

Documentation required

Title	ID	Order from
Start-Up Protocol	SPR1-130.815.12..	Siemens Med
Installation Protocol	SPR1-130.813.11..	Siemens Med
Completed project check list (one copy for each OR)	n/a	Siemens PM
Customer room plan for each OR	n/a	Siemens PM
SIOS Circuit Diagram	SPR1-130.844.11	Siemens Med
Planning Guide	SPR1-130.891.11	Siemens Med

Time and personnel requirements

Start-up of a standard system typically requires:

- 9 Mh over 2 days
(2 Mh for system testing on last day of installation plus 7 Mh for technical start-up)

Optional configuration levels and customer requests may require an additional 16 Mh.

Start-Up Protocol

A protocol has to be completed for each system. It documents initial testing of the complete system.
All work steps are recorded, including unscheduled events, deviations, and suggestions for improvements.
In case of component defects or significant deviations from the planning guide, photographs should be taken and added to the protocol.

NOTICE	**The start-up protocol should be updated as each work step is completed.**

Ground connections

Notice regarding testing or measuring the protective conductor (connection). The test is performed using the simple acoustic multimeter method (no value required). The measurement is performed using the protective conductor meter; the measurement values have to be recorded (threshold $\leq$ 200 mOhm).

Maintenance and service

The exclamation mark refers to one or more of the following measures included in the installation instructions:

1. A label has to be affixed according to the label list (appendix, installation instructions).
2. The labeling has to be unambiguous, legible, and complete.
3. After the installation is completed, the electronics cabinet can be accessed only from the front side. It must be possible to use measurement equipment at the device connections without having to disconnect device cables.
4. At certain points, cables should not be securely attached, but held together using spiral tape.
5. After completing all installation steps, accessibility has to be ensured for service and in part for operating personnel.

Compliance with these requirements has to be verified.

Technical data

All technical data can be found in the Planning Guide (SPR1-130.891.11...), the room plan, and the individual check list.

Safety information and protective measures

WARNING

Observe safety information!

Non-compliance may result in death, personal injury, or property damage.

When performing procedures and tests, you have to follow:
- **the product-specific safety information in the document,**
- **the safety information in TD00-000.860.01... ,**
- **as well as the general safety information in ARTD Part 2.**

WARNING

Voltage!

Contact with voltage-conducting parts may result in death or serious injuries.

Before replacing components, the SIOS has to be shut down and the main fuse F1 in the electronics cabinet switched off.

Product-specific safety measures

Hygiene and health-related requirements

⚠WARNING

Contamination of the entire OR environment with infectious substances!

Risk of personal infection or transfer of contaminated material to unsecured areas outside the OR.

Face masks are required inside the OR. In addition, all work has to be performed wearing disposable gloves.
Even minor injuries have to be treated and sterilized.
At a minimum, all objects removed from the OR area have to be wiped with a disinfectant.

Internal hygiene regulations apply when performing work in the OR area as well as handling tools and materials. These regulations have to be established and followed at all times.

Material brought into the OR

All required materials have to be transferred to the OR area in compliance with customer-specific hygiene guidelines. As a minimum requirement, the containers used (tool boxes and transport cases, boxes of materials, etc.) have to be cleaned with disinfectant prior to being transferred.

Cleaning

Cleaners for system components have to be approved for use inside the OR area.

All cleaning materials (cloths, brushes, etc.) may be used only once per system and have to be disposed of as non-sterile OR waste. If work is performed in the vicinity of an OR area currently in use, all personal and environmental safety requirements have to be observed.

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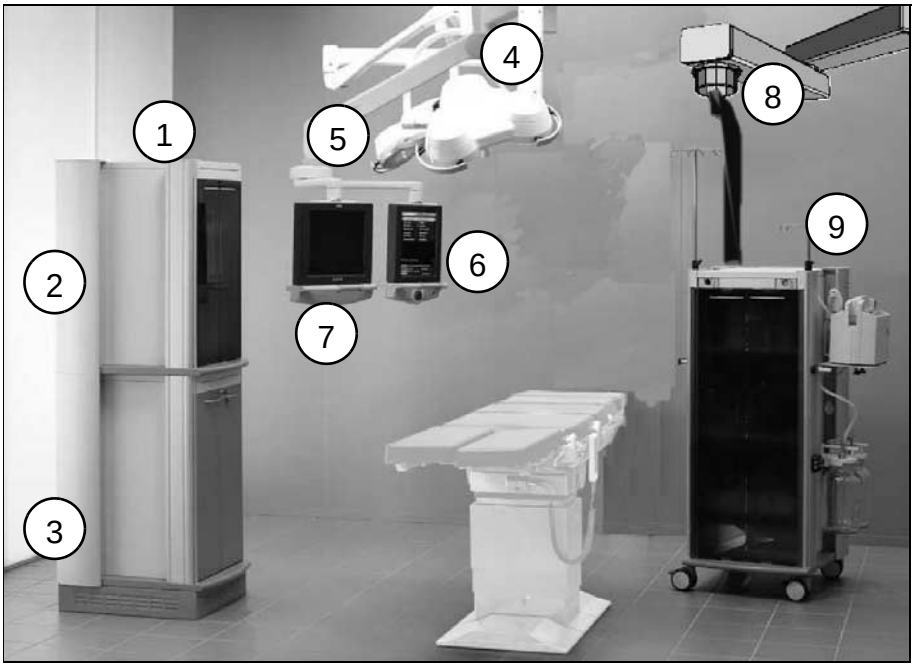

Fig. 1 System overview

Position	Abbrev.	Description
1	ES	Electronics cabinet
2	DE	Documentation unit - upper section of cabinet, incl. video components, mouse, and keyboard
3	ZS	Central control unit - lower section of cabinet, incl. SIOS_PC, integration modules, X-ray C-arm interface
4	DU	Ceiling support, display unit
5	MTS	Monitor support system
6	15" TFT	Menu monitor, operation
7	18" TFT	Image monitor
8	CL	Ceiling-mounted supply arm for device box
9	DB	Device box - accommodates surgical devices, media supply, ultrasound unit interface

SIOS functionality is achieved using integration and functional modules. This document covers the integration aspect only (SIOS delivery volume by Siemens). The functional aspects are provided by external vendors; related information should be obtained from the respective system documentation.

NOTICE

All functional modules provided by other vendors have to be available as specified in the OR equipment order before installation begins.

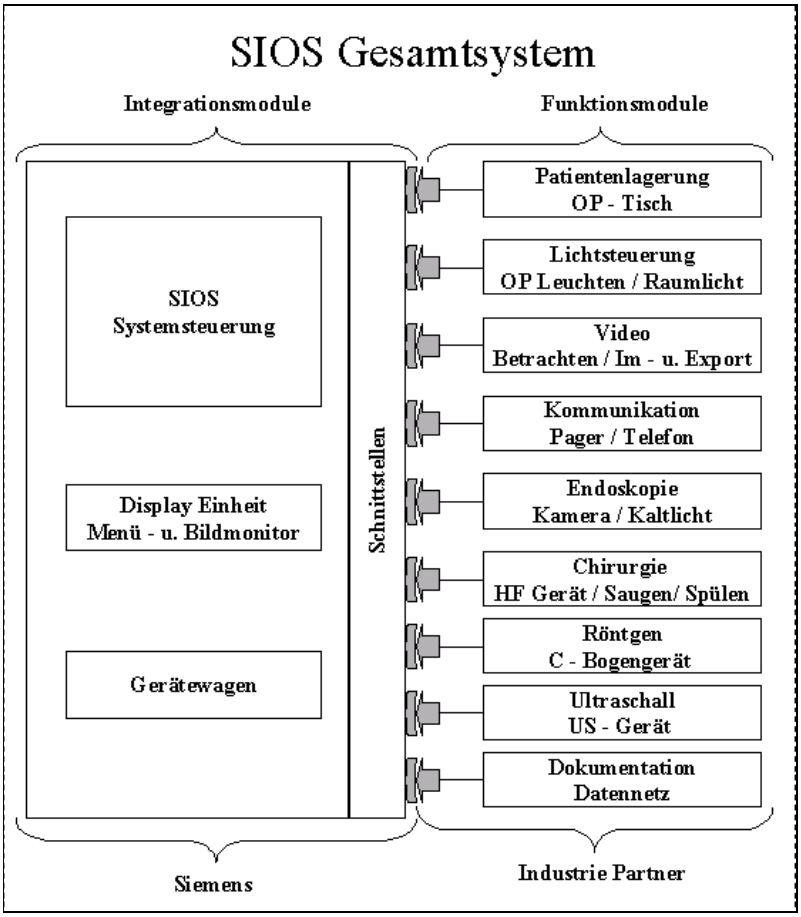

Fig. 2 Overall system

Integration modules		
Electronics cabinet incl. internal cabling	Speaker	Device box incl. internal cabling
SIOS power supply 230 V (PSU) and UPS	System cables VK 2 / VK 3 / VK 5.1	Headset and hand input device (HBT)
SIOS PC; mouse & keyboard; external ZIP drive	CAN branch 1	CAN branch 2 and 12 V power supply 2
RS 232 distributor		Separation module
CAI and modem		
Light control unit		Support arm 1 & MTS 1
MPS & 12 V power supply 1		Control monitor TFT 15”
Image mixer (video mixer)		Image monitor TFT 18”
Integration options		

Support arm 2 & MTS 2	2nd Control monitor TFT 15”	2nd Multi Power Supply
System cable VK5.2	2nd - 4th Image monitor TFT 18”	

Component positions inside the documentation unit

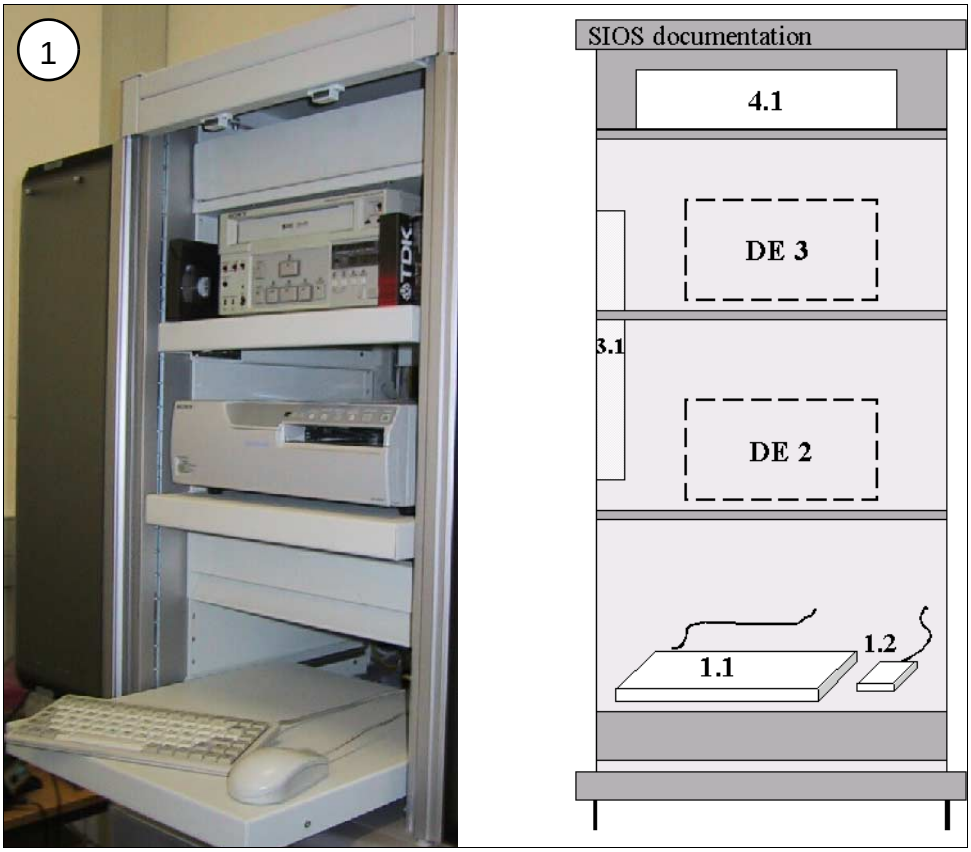

Fig. 3 Component positions inside the documentation unit

Position	Component
1	Cabinet, upper section
1.1	Keyboard
1.2	PC mouse
DE 2	Installation slot for documentation unit *1 (preferably video printer)
DE 3	Installation slot for documentation unit *1 (preferably video recorder)
3.1	ES 2 / multipoint connector 230V
4.1	Light control

*1 = components are provided by user (functional modules). If components are not available for installation, only the cables will be installed.

Component positions inside the central control unit

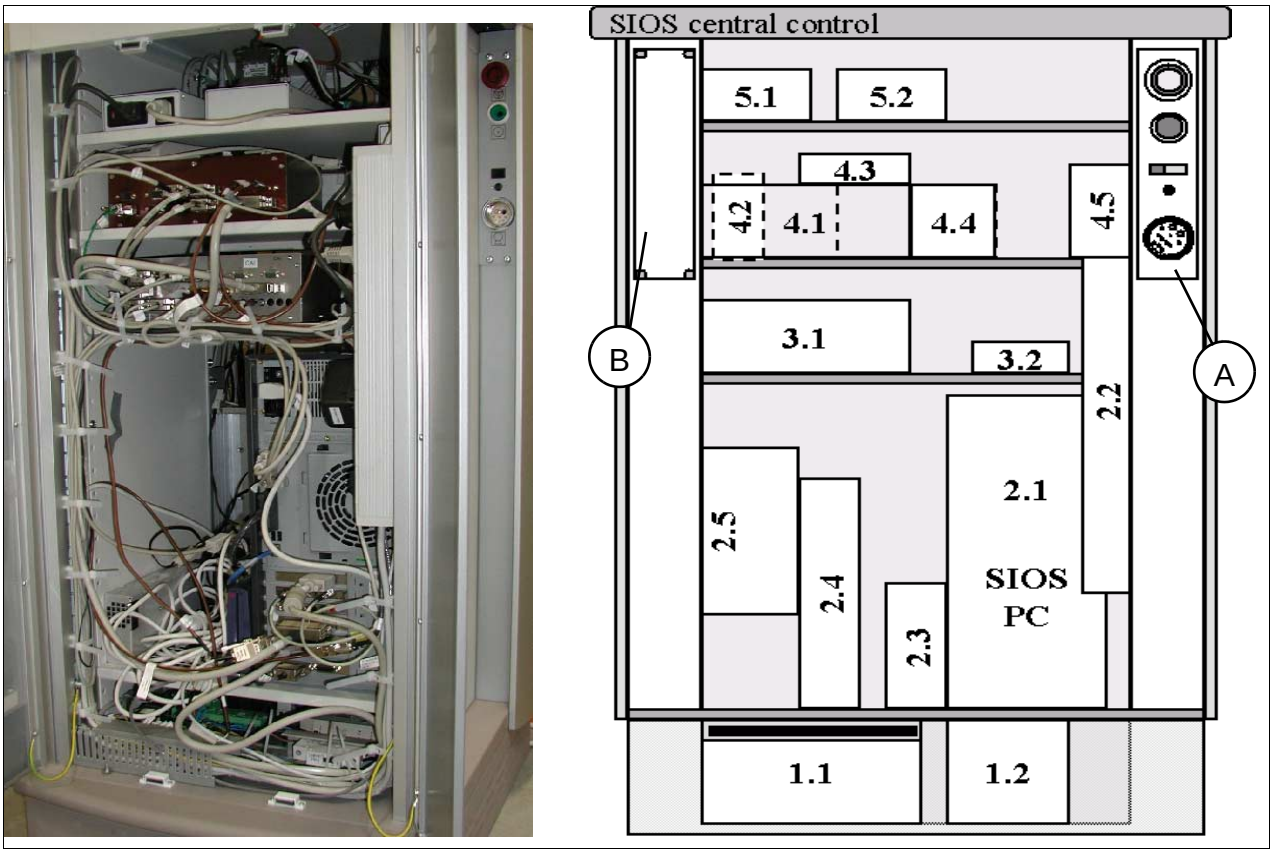

Fig. 4 Component positions inside the central control unit

Position	Component	Position	Component
A	On/off module, right-side installation	3.1	RS232 distributor
B	Bezel cover for on/off module, right or left	3.2	AAM audio amplifier
1.1	PSU / power supply 230V	4.1	CAI Audio Interface
1.2	UPS	4.2	PS 12V power supply
2.1	SIOS PC	4.3	Modem
2.2	ES1 / multipoint connector 230V	4.4	Video buffer amplifier
2.3	ZIP / external drive	4.5	VS 1/ video splitter, menu monitor
2.4	VM / image mixer	5.1	VX / video multiplexer, image monitor
2.5	MPS / Multi power supply	5.2	VR/ video receiver, image monitor

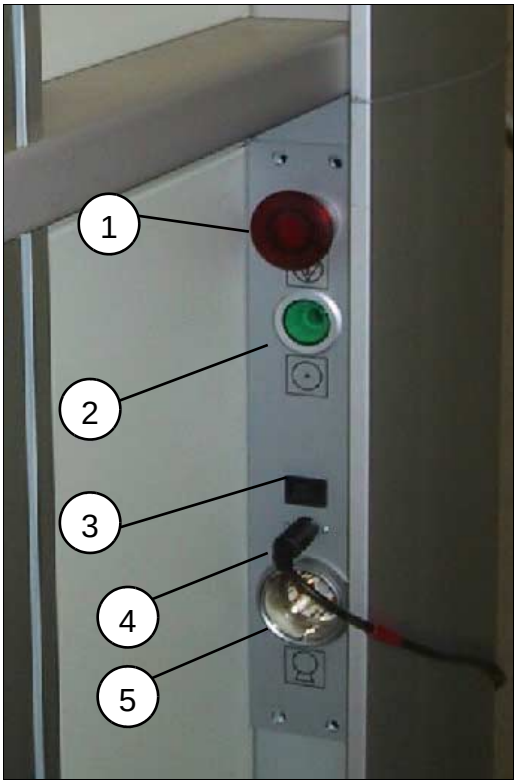

Fig. 5 On/off module inside the central control unit

Position	Component
1	EMERGENCY OFF switch
2	SIOS on/off switch
3	On/off video out
4	Video out interface
5	X-ray C-arm interface

SIOS PC connections

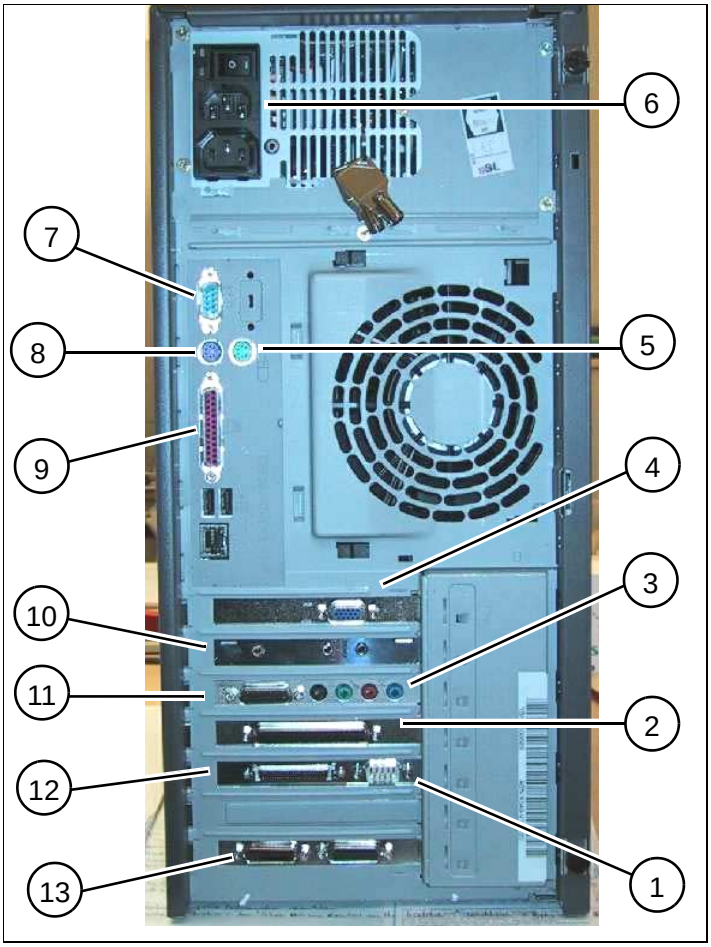

Fig. 6 PC connections

Pos.	Description	Pos.	Description
1	CANTRANS	8	Keyboard
2	Serial interface (Moxa board)	9	ZIP drive (external)
3	Speaker (HPC board)	10	Line in (HPC)
4	VGA Monitor	11	Line out
5	Mouse	12	Janz board
6	230 V line voltage	13	Sound (hand input device)
7	COM1/ Modem		

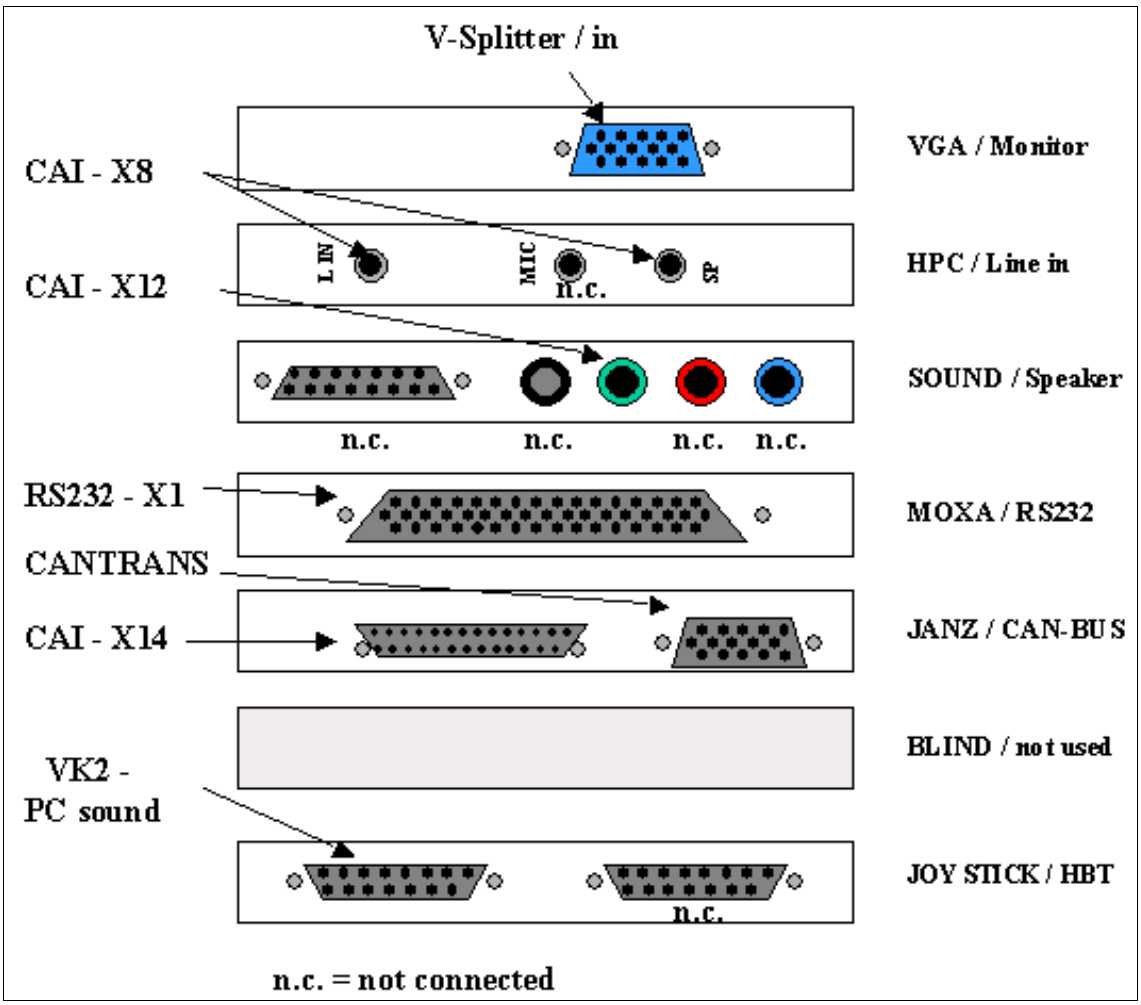

Fig. 7 PC connection - details

Component positions inside the device box

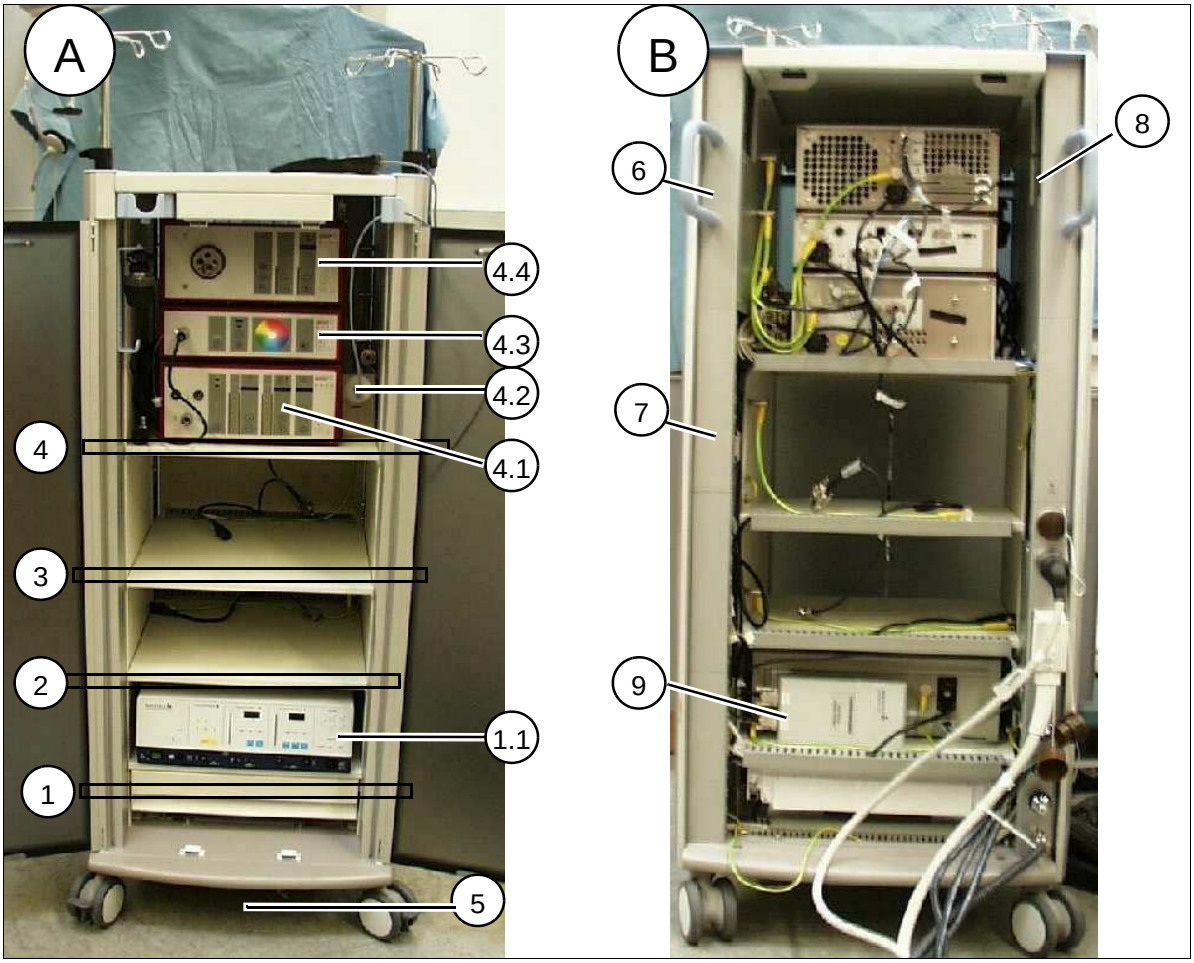

Fig. 8 Component positions inside the device box

Pos.	Description	Pos.	Description
A	DB, front view	4.2	Separation module for HBT
B	DB, rear view	4.3*	Endo camera
1	Lower mounting plate with drawer / Level 1	4.4*	Preferred location for cold light device (heat dissipation)
1.1*	Preferred location for RF device	5	IR booster (mounted below base plate, front transmit direction)
2	2nd Mounting plate / Level 2	6**	Power Supply 12 V
3	3rd Mounting plate / Level 3	7**	Multipoint connector 230 V
4	4th Mounting plate / Level 4 - preferred location for endo devices	8**	CAN branch
4.1*	Insufflator	9*	Preferred location for CAN adapter

* Not included in SIOS Siemens delivery volume / ** Installed in design profile

Device box - functional components

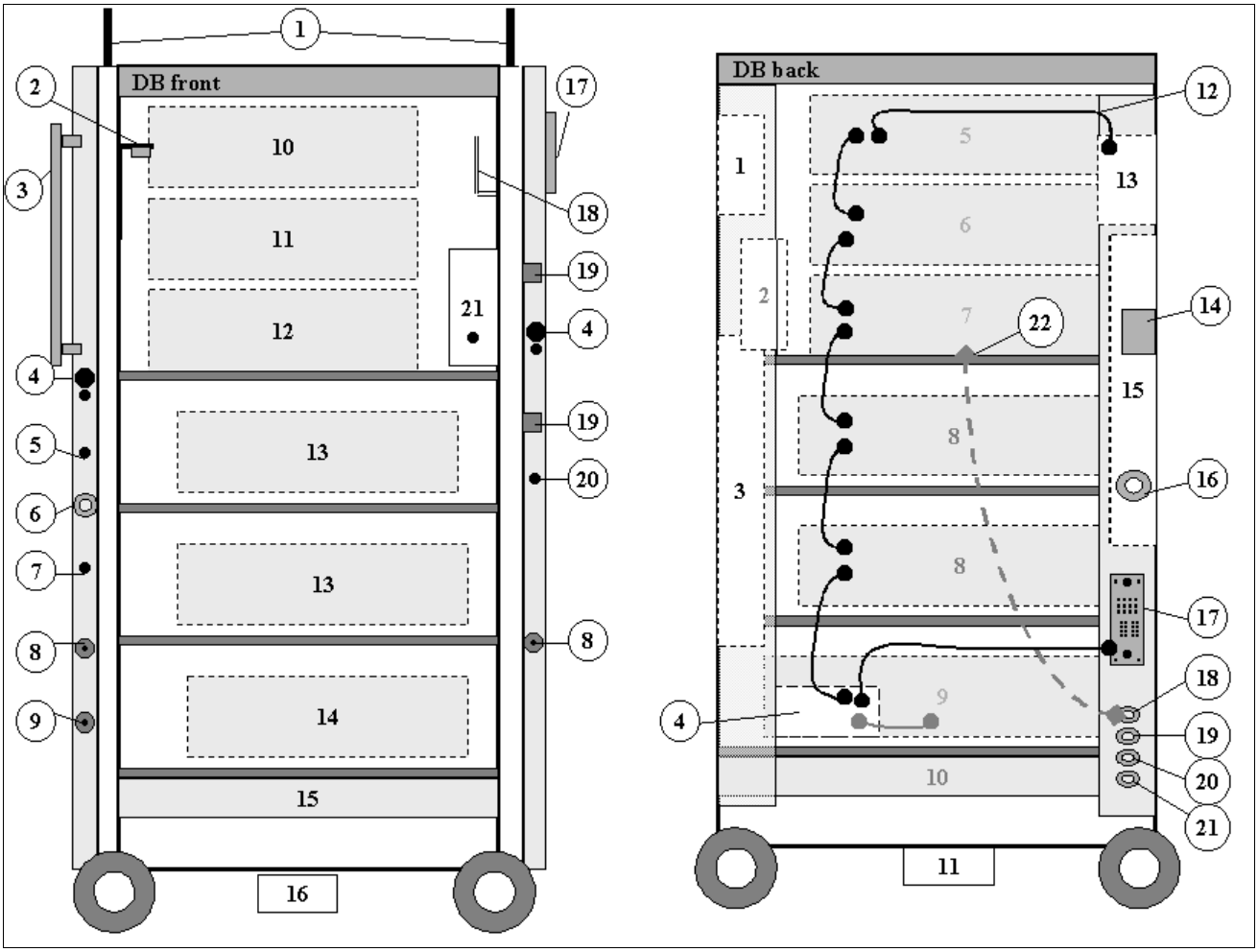

Fig. 9 Device box - functional components

DB Front	Description	Note
1	IV holder	One each on the front right and left side
2	Camera head holder	Mechanical park position for camera head
3	Perfusor holder	Anesthesia support
4	230V(110V)/150W	Line supply connection incl. circuit breaker
5	Headset connection	Connection for cable voice control
6	Video, ultrasound device	Image transmission from US device
7	Footswitch	n.c. (preparation for options)
8	Vacuum	Connection to sterile field

9	Air motor	Connection to sterile field
10	Endo cold light	Maximum heat build-up, therefore always top position
11	Endo camera	Proximity to endo light; control cable connection
12	Insufflation device	
13	Surgical equipment	Free space (e.g., rotary pump)
14	RF device	Source of RF interference, therefore always bottom position
15	Instrument drawer	Storage space for user
16	Infrared booster	OR table control; sub-flooring installation
17	HBT holder	Park position for non-sterile hand input device
18	Cable routing	Mechanical bracket
19	Standard rail	Accommodates devices (e.g., collection containers); right or left-side installation
20	CAN bus connection	Connection for SIOS-compatible devices (e.g., ultrasound)
21	Separation module	4kV separation; socket for hand input device

DB Back	**Description**	**Note**
1	Power supply 12V	Installed in design profile
2	Separation module	Back side, internal connections
3 & 15	Multipoint connector right / left	Power supply for surgical devices; installed in design profile
4	Adapter CAN-RS232	Provided by OEM
5 to 9	Back side of devices	see DB Front
10	Instrument drawer	n/a
11	Infrared booster	OR table control; sub-flooring installation
12	CAN cables	Serial from 17 to 13
13	CAN branch 2	Always CAN cable routing termination
14	Cable holder	Strain relief for VK1/VK3 from ceiling support arm
16	Video connector VK1	Video connection Endo to ES
17	System connector	Line voltage and signal connection to ES
18	CO2 in	Central supply for insufflation from VK3

19	Vacuum	Central supply from VK3
20	Compressed air in	Air motor in from VK3
21	Air motor out	Central exhaust from VK3
22	CO2 adapter	OEM-specific connection

Supply to device box

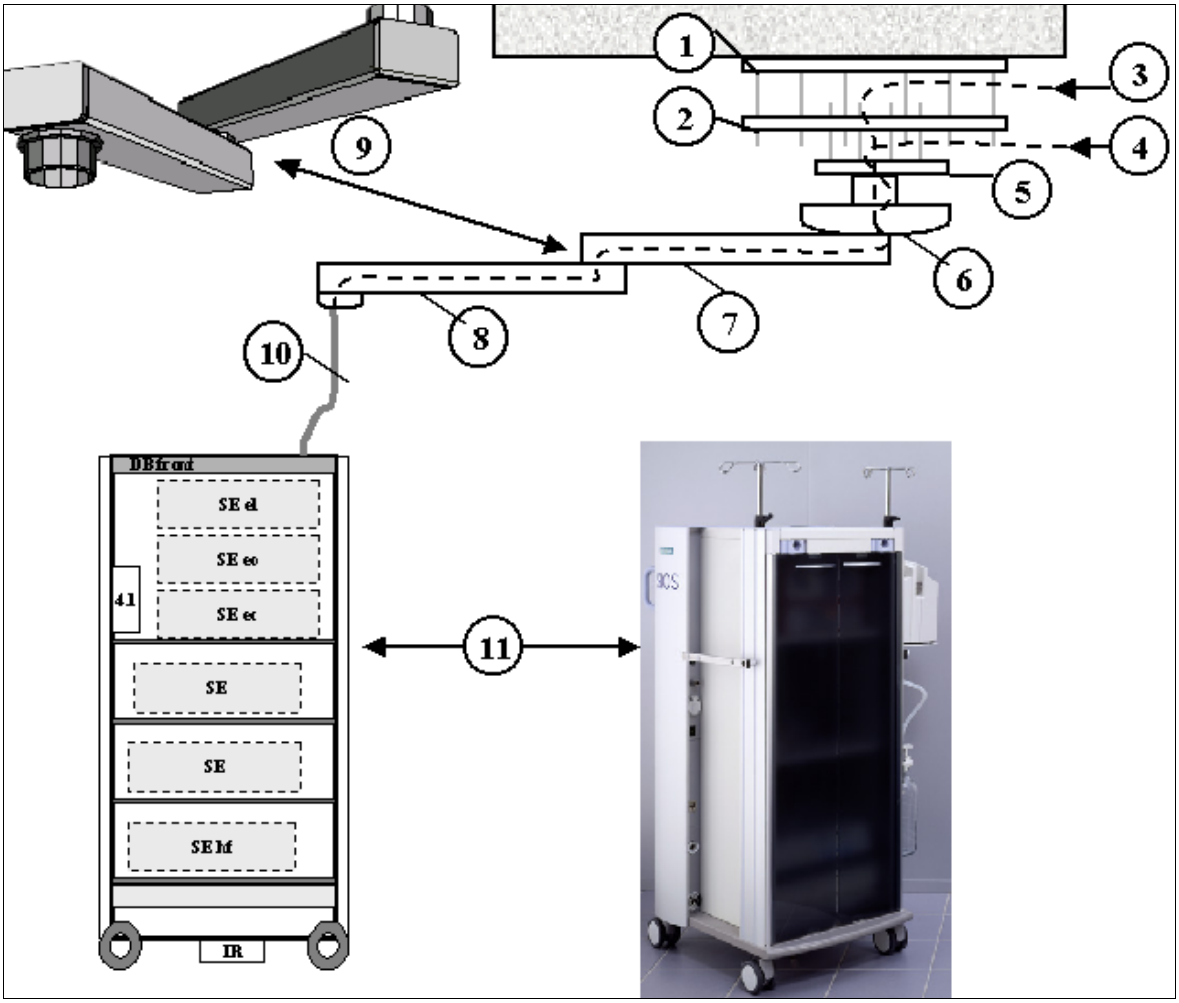

Fig. 10 Ceiling-mounted supply arm for device box

No.	Description	Note
1	Anchor plate	Unfinished ceiling installation
2	Interface plate	Alternatively single or tandem
3	Gas interface	On-site installation
4	System cable interface	VK 1 & VK3 to electronics cabinet
5	Flange	Ondascope support arm system

6	Single canopy	Does not apply for tandem connection
7	Cantilever arm 1	Length 800 or 1000
8	Cantilever arm 2	Length 800 or 1200
9	Dual cantilever arm	Diagram
10	Cables and gas hose	Supply lines to the device box
11	Device box	

Component positions in the monitor unit

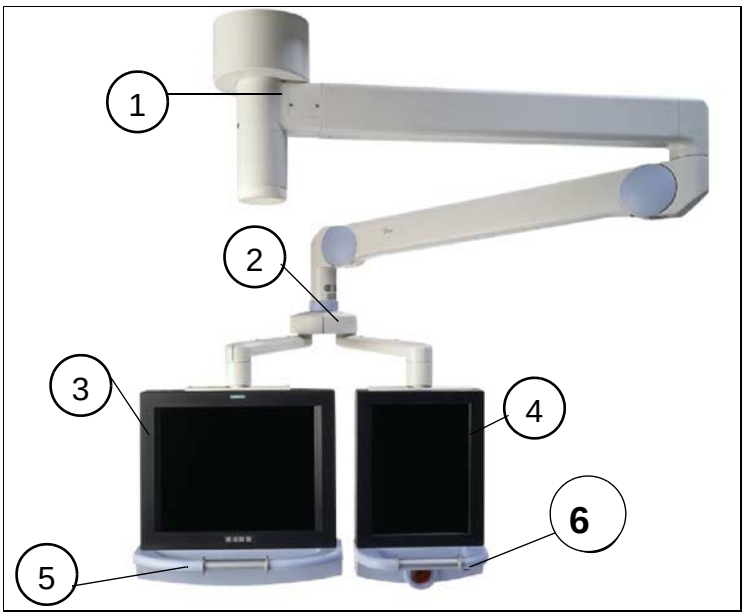

Fig. 11 Component positions in the monitor unit

Position	Description	
1	Support arm system	Onda Space
2	Monitor support system	
3	TFT Monitor 18"	
4	TFT Monitor 15"	
5	Grip module 18"	
6	Grip module 15"	Emergency Stop and Radiation On indicator

Hand input device (HBT)

Fig. 12 Hand input device

- Upper button (blue) for "Menu Back" function.
- Right and left buttons (yellow) for "Selection Menu Item" at menu monitor.
- Arrow buttons (white) for "Selection Menu" / up or down at menu monitor.
- Lower button (white) for "Start Printing" function (video printer - no menu display at monitor).

Keyboard

The dark-colored function keys are labeled with the same international symbols on all keyboards. The light-colored "Editor keys" are labeled in the respective national language.

Fig. 13 Keyboard

The language ID on the model plate is indicated by the two letters following the article no.

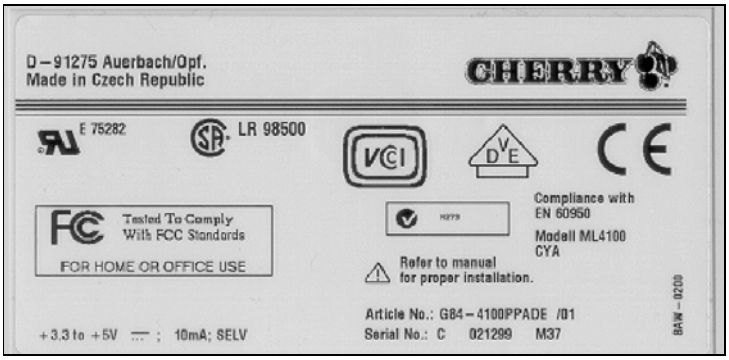

Fig. 14 Model plate (bottom side of keyboard)

Country ID		**Material no.**
Germany	DE	3080900
Switzerland	CH	3080926
United Kingdom	EN	3080942
Spain	ES	3080934
Italy	IT	3080959
Norway	NO	3080967
Finland	SF	3080975
Belgium	BE	3080918

Modem

Country-specific modems always include a power supply, phone cable, and PC interface cable.

Country ID		Material no.
Germany	DE	3076940
Austria	ÖST	3082732
Switzerland	CH	3082724
The Netherlands	NL	3082658
Luxembourg	LX	3082674
Belgium	BE	3082641
United Kingdom	GB	3076965
Sweden	SW	3082690
Norway	NOR	3082682
Spain	ES	3082666
Italy	IT	308270

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Preliminary steps

All information in the following "Preliminary steps" list has to be available. Function tests for phones, pagers, and mobile OR tables have to be planned in coordination with OR management.

Preliminary steps		
1	Phone number for modem has to be known and activated	
2	Telephone system data have to be known	
3	List for "Phone Menu" configuration has to be available	
4	Pager system data have to be known	
5	List for "Pager Menu" configuration has to be available	
6	External fixed network phone is required to test phone functionality	
7	In-house pager is required to test pager functionality	
8	At least one OR table must be available	
9	Check cables LC to Connection and Documentation room control panel	
10	"Stand-alone" function test for OR and roomlight (on/off dimmer)	
11	Query regarding IP device availability (use and interface)	
12	IP devices are fully functional in "stand-alone" mode	

Installation completion checks

The following items up to the "Installation completion" section have to be performed on the day of installation completion and documented in the start-up protocol. Certain procedures may have to be performed by installation personnel.

NOTICE

The engineer responsible for start-up has to be present on the day of installation completion.
The following checks have to be performed while installation personnel is still present.

Installation check		
1	The room and system configuration specified in the order (project manager) has to be available in written form	
2	Visual inspection to ensure that the system corresponds to the hardware configuration	
3	Check serial numbers for completeness (installation protocol, serial no. list)	
4	Check system cabling for completeness	
5	Installation protocol has to be completed	
6	The installation protocol has to indicate compliance with the prerequisites for initial start-up. (Partial start-up is possible without surgical IP devices.)	
7	Gas testing has be done in-house or scheduled within the start-up phase (set a date)	
8	Check isolated installation (see below)	
9	Check labels, maintenance positions, and supply lines for all components	

Isolated installation test

The protective conductor connection to the ceiling support arms, monitor support system, device box, and electronics box should be established only from the connection point inside the electronics cabinet (central ground connection). Clamp off the incoming protective conductor of the power supply and test the components mentioned above against the open end of the clamped-off line for continuity. There should be a high-impedance transition at maximum (e.g., conducting floor to cabinet or device box).

In case of a low-impedance transition, determine and eliminate the cause (e.g., installation and protective conductor connections for ceiling panels).

Reconnect the protective conductor of the power supply.

Maintenance positions and identification

All components have to be connected so that they can be accessed with measurement devices while all lines remain connected. (See installation instructions, chapter "ES Cabling and Connections.") All line terminations have to be clearly labeled. These procedures are indicated by an exclamation mark (!) in the margin in the installation instructions.

Preparations for initial start-up		
1	Measure on-site voltage supply at line connection of PSU / F1	
2	Switch on SIOS PC at back side	
3	Switch on image mixer and video splitter	
4	Switch on modem	
5	Check DIP switches on back side of VCR (1-4=off / 5+6 =on)	
6	Video in/out splitter, receiver & multiplexer ON / sync DIP switch = on	
7	Switch on multipoint connectors in cabinet and device box	
8	Switch on SIOS monitors	
9	Unlock EMERGENCY STOP at 15“ grip module	
10	Switch off video printer and VCR	
11	Switch off all IP devices	
12	Unlock EMERGENCY OFF at the on/off module	

DIP switch settings

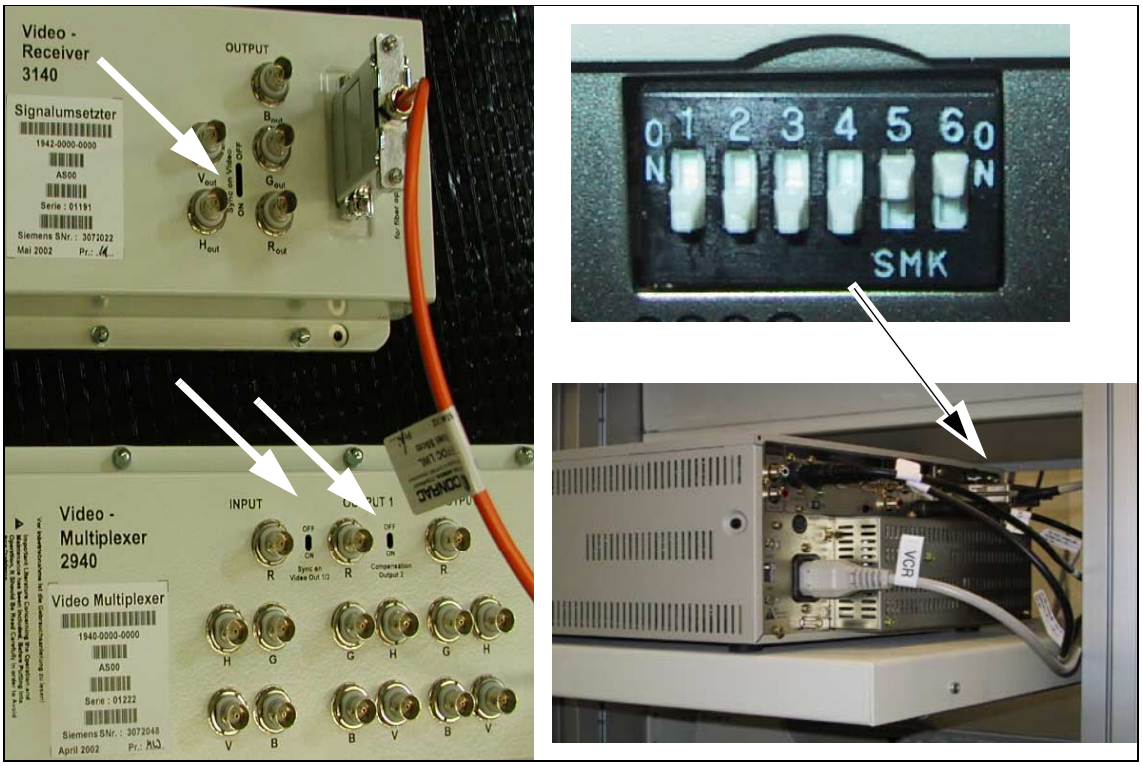

Fig. 1 DIP switch sync & DIP switch VCR

Performing the initial start-up

NOTICE

In the following steps, basic system functions are performed to ensure correct cabling and connections. Do not perform any configuration or tune-up steps, etc. at this point. The purpose is to determine if the installation personnel can leave the installation site.

Switch on fuse F1 at the PSU inside the electronics cabinet.

NOTICE

The "SIOS Melody" start-up sound may be set very loud. To avoid interference with the OR environment, disconnect the "Speaker" plug (gn) from the sound card at the SIOS PC. Do not reconnect until you perform "Volume" configuration.

Switch on and boot up the system using the green SIOS ON switch (on/off module inside the electronics cabinet). For initial start-up, the SIOS PC may have to be switched on in front.

NOTICE

During the start-up phase, do not switch components on/off that are connected to SIOS. Otherwise, you may have to go through unnecessary troubleshooting.

The SIOS computer starts with a standard WINDOWS start-up displayed on the menu monitor. It is shown against a blue background turned by 90 degrees in clockwise direction. (Power supply unit & VGA cable for PC monitor OK.)

A Siemens logo is displayed for approx. 2 seconds at the image monitor during the start-up phase. This is followed by a blue screen.
(Power supply, monitors, electronics cabinet OK.)

The SIOS logo with correct image orientation is displayed at the menu monitor while WINDOWS is starting up. (PC start-up OK.)

When the green progress bar is at about 30%, the SIOS signature melody is played for approx. 30 seconds. (Audio lines for speaker OK.)

The software version including the time/date is displayed above the progress bar. All information has to be recorded in the protocol. After start-up is completed, the eight menu bars (Fig. 2) have to be displayed in the order indicated. (PC OK.)

During the logon or start-up phase, check the menu monitor for information / error messages. This may be an early indicator for corrective actions.

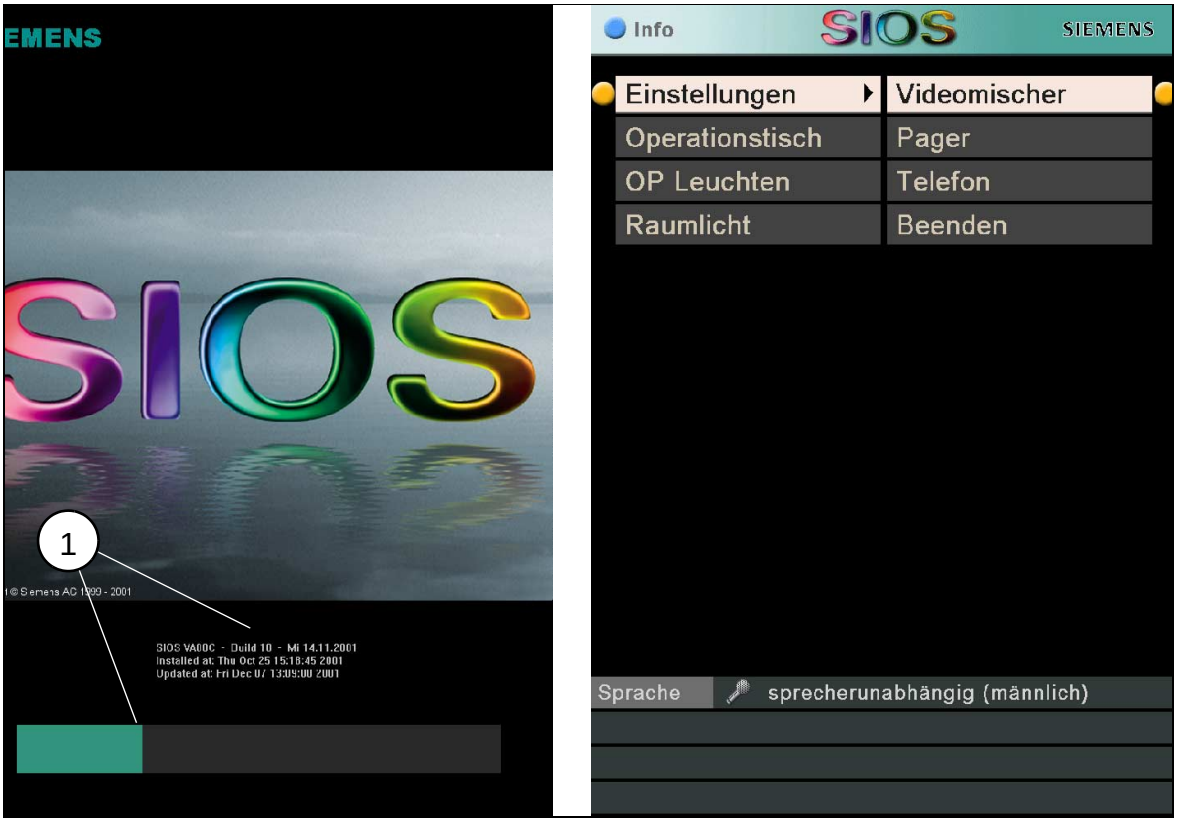

Fig. 2 SIOS start-up - SW version & Start menu

- Setup - Video mixer
- OR table - Pager
- OR lights - Telephone
- Roomlight - Exit

If the monitor settings are incorrect, they can be adjusted at a later time using the TFT Monitors supplemental documents.

System operation test

Navigate the menus using the hand input device and check the Room and OR lights functions. (Lighting is assigned during configuration.)
(Lines for roomlight, HBT, and CAN bus OK.)

Check the same functions using the headset and voice control (default user language is German). If the correct national language has not yet been set, select voice training in the "Setup" menu using the HBT. Select the "Manual Microphone Adjustment" option, enter the "Service" user name, and check the volume level while speaking into the microphone. This will help you determine if the level changes.
(Audio path via separation module OK.)

Initiate a table movement by pressing and holding the button on the HBT. The tone for table movement sounds through the speakers.
(IR booster line OK.)

Press the EMERGENCY STOP button at the grip module of the menu monitor. An error message is displayed, and table movement should be disabled.
Release the EMERGENCY STOP button; the OR table is once again functional.
(Emergency stop circuit OK.)

Switch on VCR, wait for logon at menu monitor, insert video cassette, and select PLAY function. Select Main Picture Video Recorder in Videomixer menu. The image information fills the entire image monitor.
(RS232 Recorder; monitor path TFT 18" OK.)

Perform all functions in the Videomixer menu in sequence.
(Videomixer OK.)

Switch on video printer - Videomixer = Main Picture Video Recorder; Video recorder = Play plus Pause, generate frozen image on the image monitor. Activate "Print function" using the white button at the bottom of the HBT. Cancel VCR frozen image.
(Printer path OK.)

Power failure simulation:
Briefly deactivate and reactivate fuse F1 at the PSU. The message "SIOS battery operation" is displayed; an acoustic signal sounds at the UPS. Press the green SIOS ON button - this should restore normal operation.
(UPS circuit OK.)

Use the EXIT menu to shut down SIOS completely and wait until the system shuts down.
(Shutdown circuit OK.)

Restart SIOS; after start-up, switch on the last IP device connected in the CAN chain (typically ENDO cold light). Wait for menu logon and perform certain menu operations. Switch IP device off again.
(CAN path and power supply in device box OK.)
NOTE: The CO_2 gas pressure at the insufflator must be sufficient; otherwise, logon at the CAN bus will fail.

Switch on endo camera and wait for logon. Select Main Picture Endo Camera at video mixer.

NOTE:

If no endo camera is available in the device box, the VCR in the device box is used instead. Connect the VCR using the power supply cable and video signal cable of the endo camera only. Play the test cassette and select the Main Picture Endo Camera via the video mixer. (Video line from device box OK.)

EMERGENCY OFF test - activate red switch at the on/off module inside the electronics cabinet. SIOS shuts down, power supply to device box and image monitor is maintained. Release switch again and restart SIOS using the green button. (In some cases, the menu monitor does not display the default image after start-up. In this event, exit as usual. After the system shuts down, perform an additional restart.)
(EMERGENCY OFF circuit OK.)

Completion of function test

If all steps described earlier have been completed successfully, the installation personnel can continue with the "Concluding Steps" chapter in the installation instructions. After all covers have been installed and the electronics cabinet has been moved to its final position, another SIOS start-up is performed.

Mechanical check

All covers have to be installed completely, SIOS has to be switched on, and all components have to be logged on. For the following tests, all components have to remain in stable operation (no line or interface damage).

Test all rotation and lift/lower movements of the support arms, MTS, and monitors. Check ease of movement, end stops, and random stop positions. All defined stop positions have to be maintained without unintentional movement.

Approach the park and work positions of the device box. Check ease of movement, end stops, and random stop positions. All defined stop positions have to be maintained without unintentional movement of the ceiling-mounted support arms.

Visual inspection

Inspect the complete system for contamination and paint surface damage.

Protective conductor measurement

Perform protective conductor measurement according to ARTD Part 2.

The following points should be measured against the central ground inside the electronics cabinet (PSU):

- Sliding trays in the upper section of the ES
- ES external covers and lower section doors
- Device box external covers and holding trays for surgical devices
- Support arm cover screws up to 2m above floor level
- MTS cover screws and monitor housing

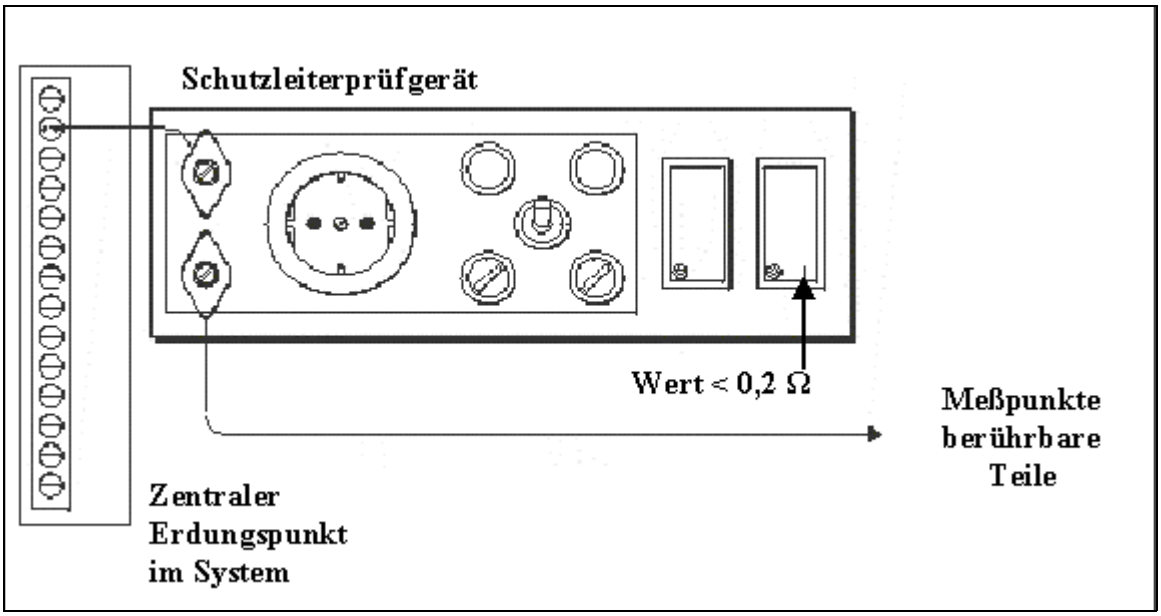

Fig. 3 Protective conductor meter

Installation completion

The installation protocol is completed (as necessary) and signed by the persons listed in the protocol.

This confirms that installation has been completed successfully. The master copy of the protocol is kept in the system folder at the customer site; copies have to be sent to the addresses listed in the installation protocol.

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NOTICE	**Several of the steps below were completed during the preparation phase. If they passed without errors, they can be marked as completed in the protocol.**

Switching on the system

Switch on and boot up the system using the green power switch. For initial start-up, the SIOS PC may have to be switched on at the front side.

NOTICE	**During the start-up phase, do not switch components on/off that are connected to SIOS.**

The SIOS computer starts with a standard WINDOWS start-up.

The start-up is displayed at the menu monitor against a blue background and turned by 90 degrees.

A Siemens logo is displayed for approx. 2 seconds on the image monitor during the start-up phase. The logo is followed by a blue screen.

Fig. 1 SIOS Start

Status check

The SIOS logo with correct image orientation is displayed on the menu monitor after WINDOWS start-up.

When the green progress bar is at about 30%, the SIOS signature melody is played for approx. 30 seconds (speaker not connected!? PC sound card gn).

The software version including data is displayed above the progress bar (record in protocol).

After start-up has been completed, the screen should show at least the eight menu bars displayed.

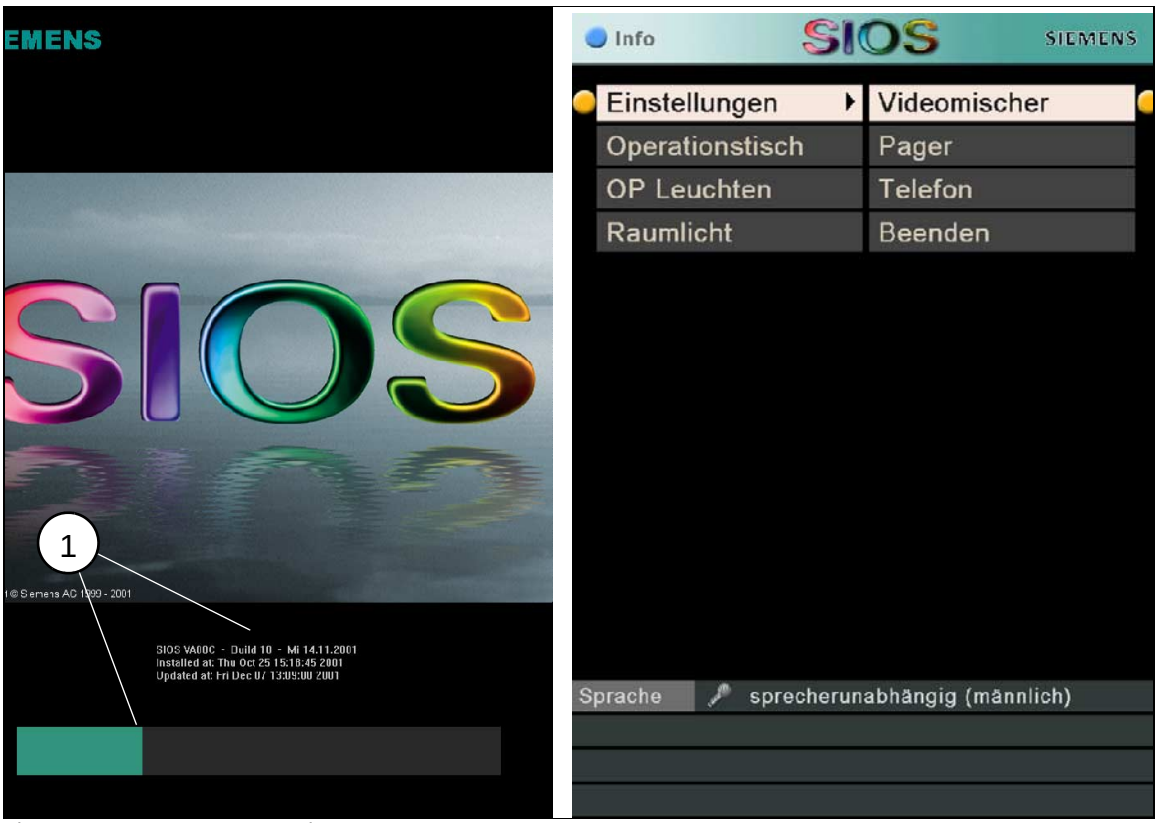

Fig. 2 SIOS start-up - SW version & Start menu

If the monitor settings are incorrect, they can be adjusted using the TFT 15" monitor supplemental documents.

Checking the RS232 interface

If the video printer and VCR components are available, switch them on and wait until the system logon is finished.

Control menus - RS232 components	
Video recorder	Telephone
Videomixer	Pager
Videoprinter *	

* For the videoprinter, only a message in the information line is displayed. No control menu is available.

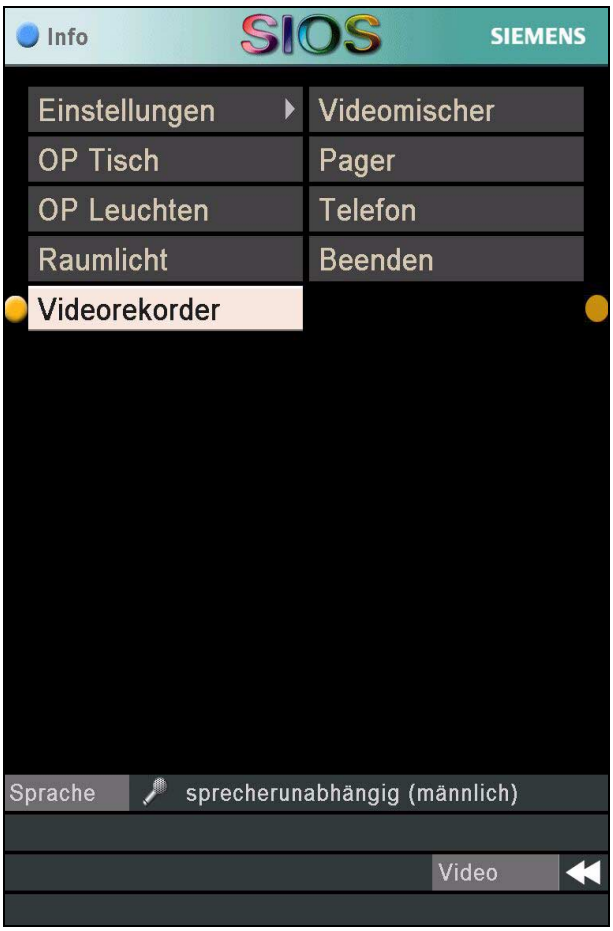

Fig. 3 RS232 components menu

Checking the CAN interface

Switch on a surgical device (if available) and wait for the system logon to finish. Each message is confirmed with a confirmation tone, and the menu bar with the name of the component is displayed at the menu monitor. When selecting the component, the logo of the device manufacturer is typically displayed at the upper right edge of the screen.

Repeat for each additional component.

Control menus - CAN components	
OR lights	ESU
Roomlight	Suction pump
Endo light	X-ray system
Endo camera	Ultrasound
Insufflator	

NOTICE **The CO_2 gas pressure at the insufflator must be sufficient; otherwise, logon at the CAN bus will fail.**

If none of the devices are available at the time of initial start-up, the CAN connection is tested using the room and OR light controls only.

If the functions do not correspond to the respective light sources, they can be adjusted at a later time in a separate configuration step.

Checking the video path

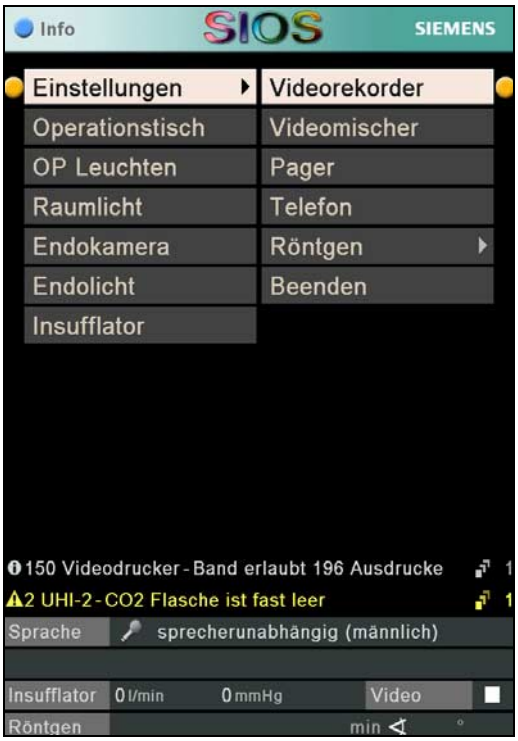

Fig. 4 Main menu

NOTICE **If a video image source is not part of the delivery volume, a loaner unit (VCR) is used instead.**

- Select Main Picture Video Recorder from the "Videomixer" menu.
- Press Play to play a video cassette with any color picture information.
- Select "Main Picture Video Recorder" from the "Videomixer" menu using the HBT.
- Select "Video recorder" from the "Picture in picture" menu.
- Test the various positions in the "Position" menu.

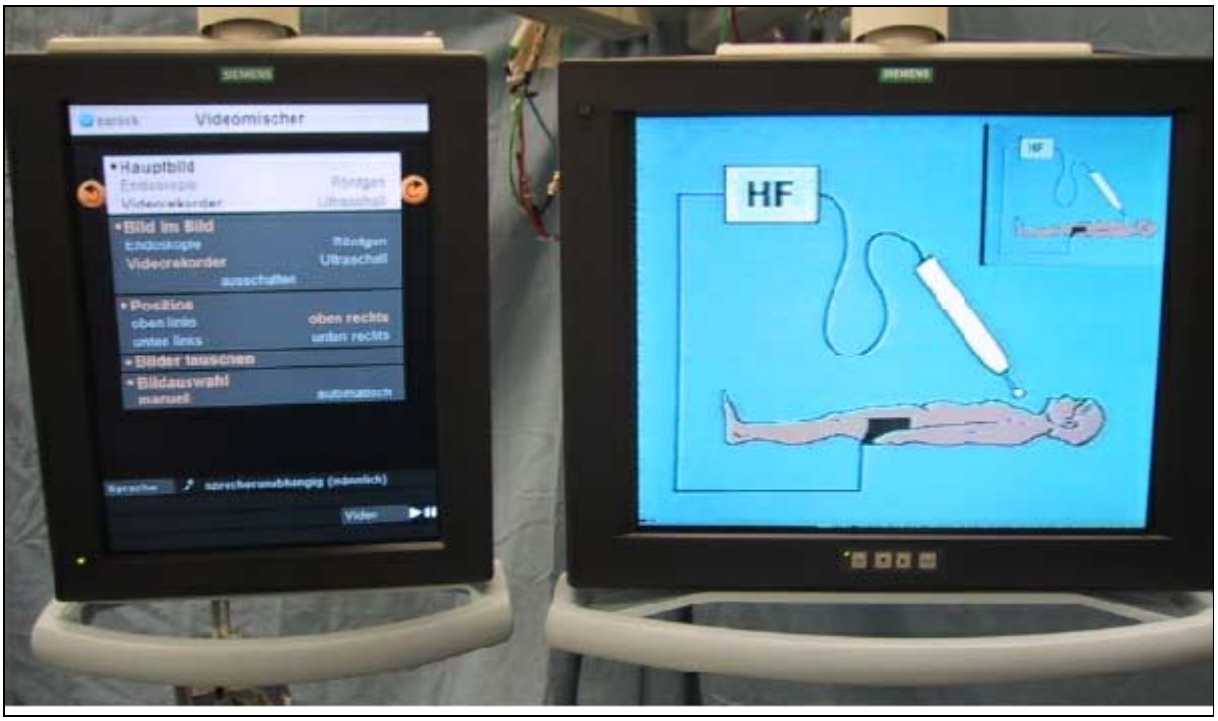

Fig. 5 Videomixer menu - Main Picture Video Recorder

- If another image source is available (Endo camera), it is selected as "Picture in picture" video source.
- Test the "Change pictures" menu.
- If the monitor settings are incorrect, they can be adjusted using the supplemental documents for the TFT 18" Monitor.

Basic video printer settings

NOTICE	**The video printer is optional. If it is not available at the time of initial start-up, skip this chapter.**

Establish a direct connection between printer and image monitor:

Disconnect the "VCR in" cables at the back side of the VCR and leave them disconnected.

Disconnect the "VCR out" cable (VCR) and connect to the "Video out" connector at the back side of the printer.

Select Main Picture Video Recorder from the "Image Mixer" menu.

Open the protective cover of the video printer and press the Menu button. The settings are displayed on the monitor only. Use the arrow buttons at the printer to define the basic settings.

Fig. 6 Video printer control panel

The 5 programming steps COL / LAY / PRN / IN / OUT are predefined using the arrow buttons.

Active values are displayed on screen in color (typically green);

all other values are displayed in white.

Fig. 7 Video printer - color adjustment

COL settings

LOAD COLOR = 1 / CYN to LIGHT = 0 / SHARPNESS = 8 / SAVE COLOR = 1

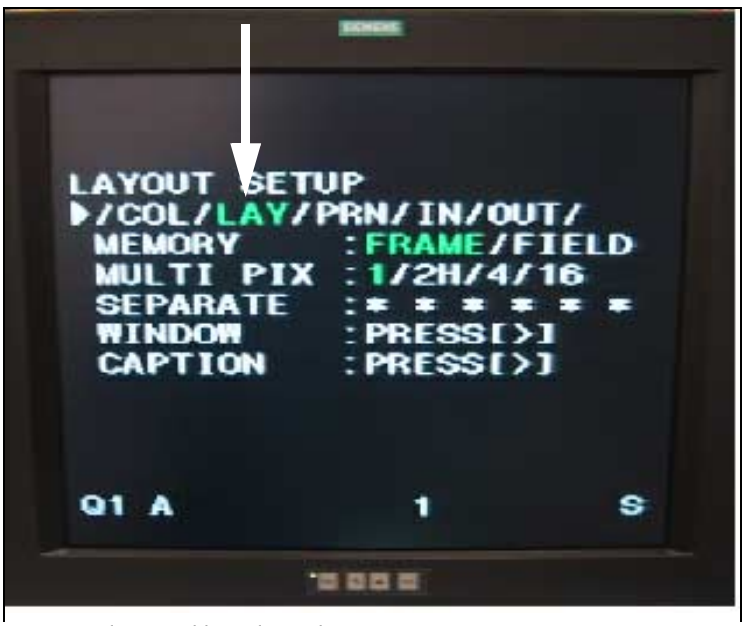

Fig. 8 Video printer - layout setup

LAY settings

MEMORY = FRAME / MULTI PIX = 1

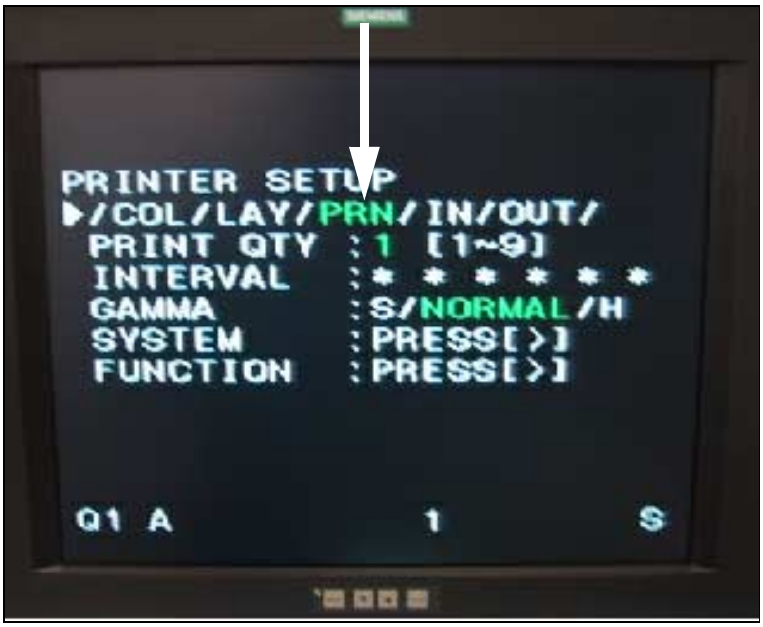

Fig. 9 Video printer - printer setup

PRN settings

PRINT QTY = 1 / GAMMA = NORMAL

Fig. 10 Video printer - input setup

IN settings

INPUT SEL = S-VIDEO / AGC = ON

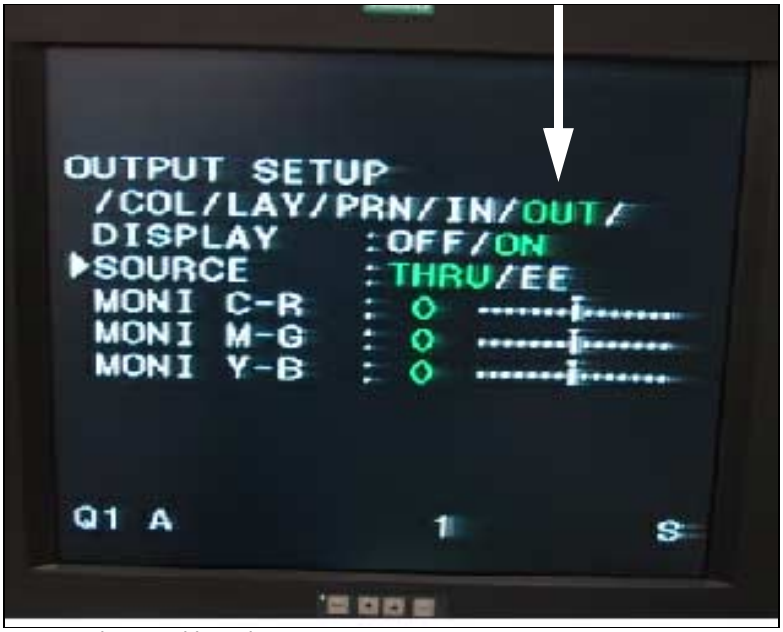

Fig. 11 Video printer - output setup

OUT settings

DISPLAY = ON / SOURCE = THRU

Press "EXEC" to save all settings.

When finished, restore the original video cabling.

Configuration

The following software configurations require a SIOS restart to become effective.

SW configuration - initial steps

- Select "Setup" menu using the yellow button on the hand input device (HBT).
- Select "Service" / "Activate service" (from here, use mouse and keyboard).
- Enter Password1* and select "OK" to open the "SIOS Configuration" window (*make sure that passwords are typed correctly).

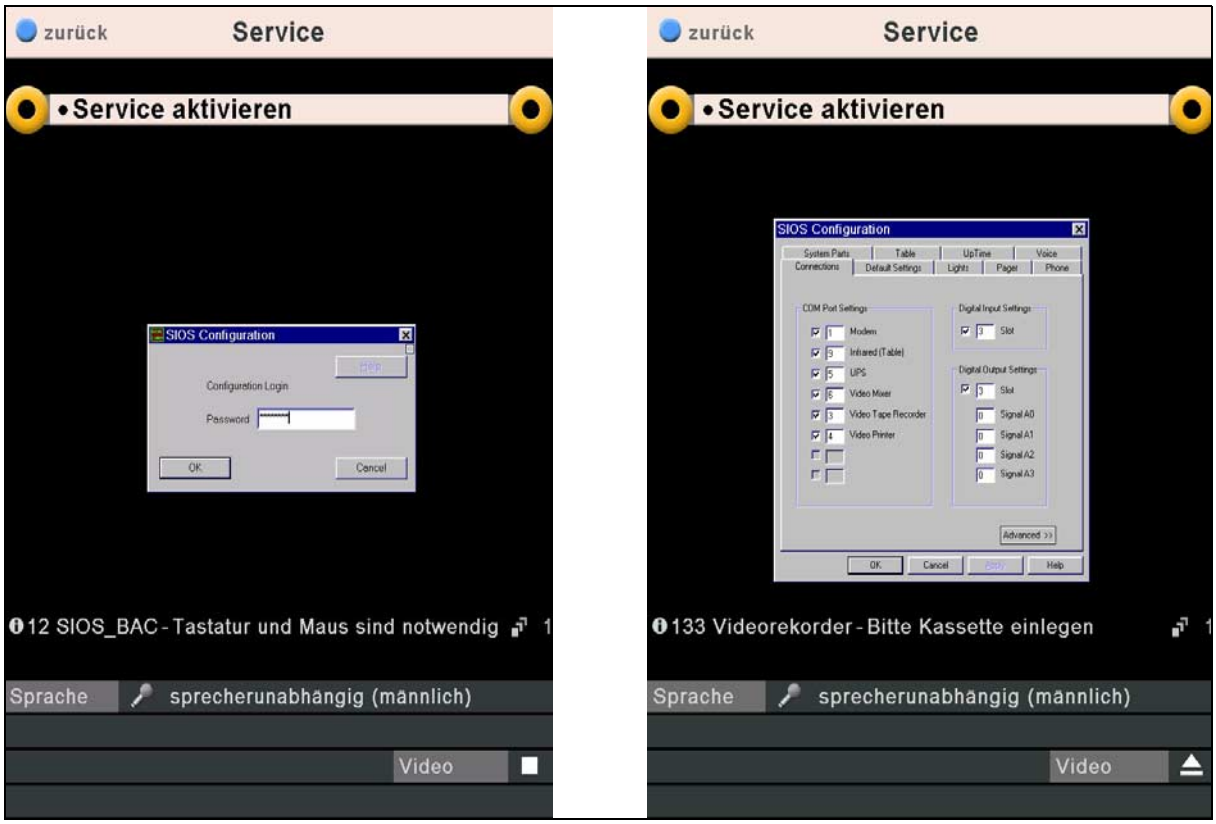

Fig. 12 Service Password 1 & Config Task cards

- Transfer all values from the "Connections" task card to the protocol.
- Confirm check under "Advanced>>" in the protocol.

Setting the volume

- Connect speaker connector (PC sound card / gn).
- Select "Volume Control" from the "Default Settings" task card.
- The "Volume Control" window may be hidden behind the "SIOS Configuration" window. In this case, drag the window using the mouse.
- Adjust the volume under "Volume Control" & "Wave" using the mouse. An acoustic confirmation signal sounds when pressing the blue button on the HBT.
- Adjust the speaker volume to the surroundings. (Preliminary setting; has to be confirmed with the user at a later time.)

NOTICE	**All acoustic signals have to be loud enough, but should not interfere with regular OR communication. For safety reasons, this setting may not be set to zero or deactivated.**

Fig. 13 Volume Control

Defining default settings

- "Play Sound for Infomation and Warnings" has to be checked.
- Set the value for "Return to Main Page after" to 600 sec.
- Set the value for "Delete Infos/Warnings after" to 30 sec.

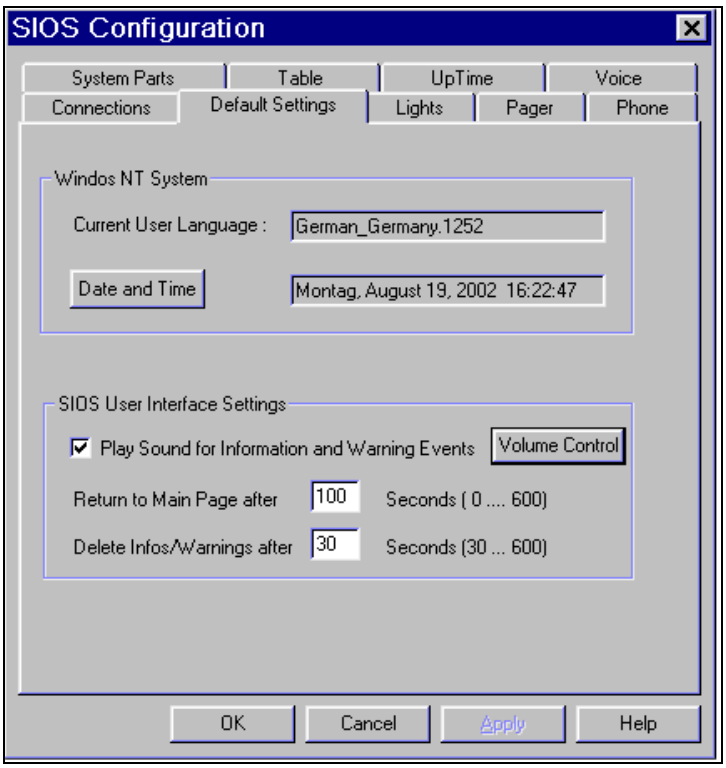

Fig. 14 Default Settings

- Set "Date and Time" only if the current system values are not appropriate for the installation site.

Deactivating ClearKey

This step allows direct access to the system software. The "ClearKey" has to be reactivated after configuration has been completed.

- Select "System Parts" task card.
- Select "Security Page" and enter Password 2*.
- (* : Make sure passwords are typed correctly.)
- Deactivate "Set/Clear Key Intercept Flag."
- Click the "Close" box to close the Security window.
- Click "OK" in the System Parts window.

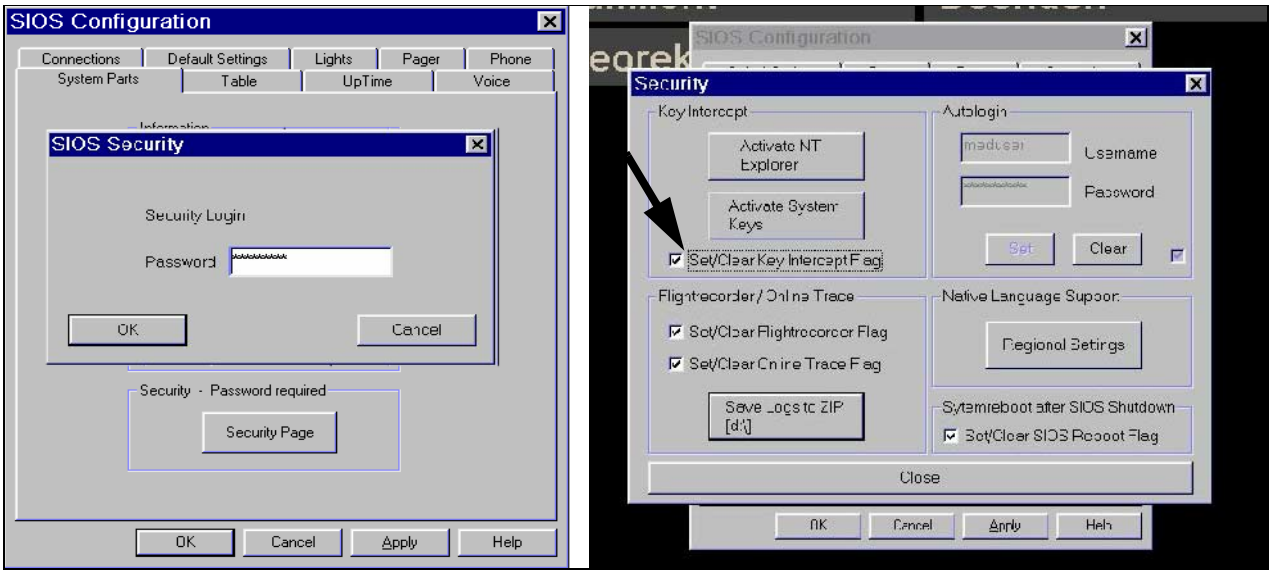

Fig. 15 Service Password 2 - Set/Clear Key Intercept Flag

NOTICE

When the "ClearKey" is deactivated, it is possible to access the system software.

Before making the system available to the user, this function has to be reactivated.

Restart SIOS after making this change.

Restarting SIOS

SIOS has to be restarted for the SW configuration changes to become effective.

The restart is performed from the User menu.

Select the "Exit" menu and "Restart" from the "Exit SIOS" menu. Wait until the SIOS restart has completed (if the "start-up sound" is too loud, disconnect the "Speaker" plug from the PC sound card and adjust the volume using "Volume adjustment").

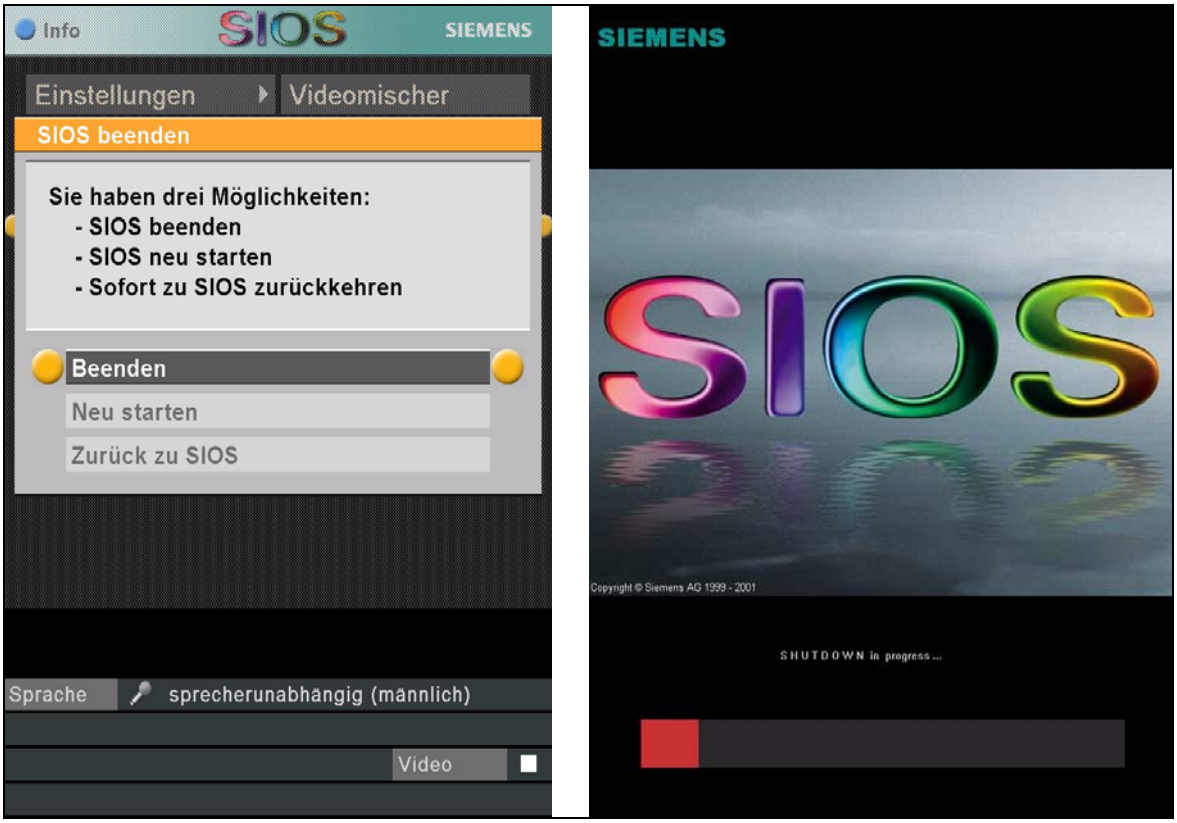

Fig. 16 Exit & Shut down

Wait until the SIOS start-up has completed.

During the start-up phase, do not switch components interfacing with SIOS on/off or perform other operations.

Keyboard configuration

- Press Ctrl+Esc to open the WINDOWS Start menu.
- Select "Settings," "Control Panel" using the four arrow buttons.
- Select country under "Keyboard," "Input Locales" in the Control Panel.
- Select the language version of the keyboard and click "Set as Default" to save the setting.

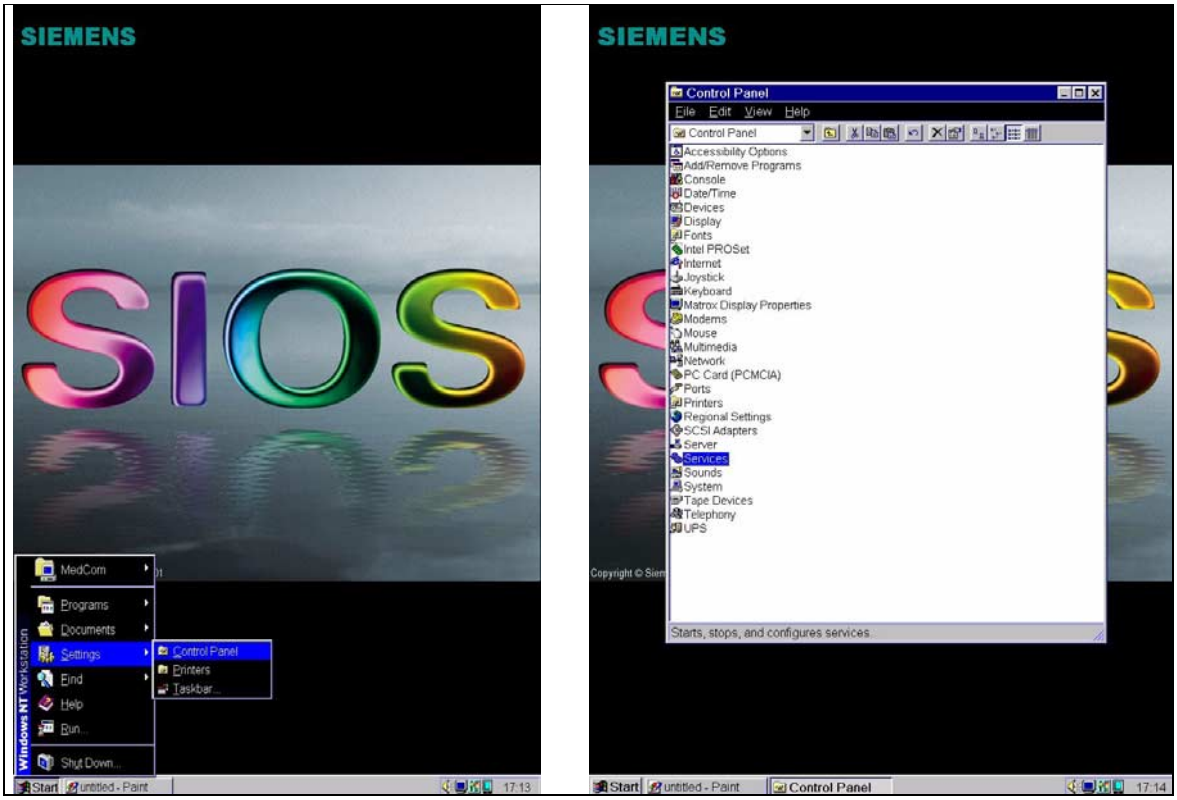

Fig. 17 Start / Settings & Control Panel

User language configuration

- Press Ctrl+Esc to open the WINDOWS Start menu.
- Select MEDCOM\TOOLBOX\STOP APPLICATION (NORMAL).

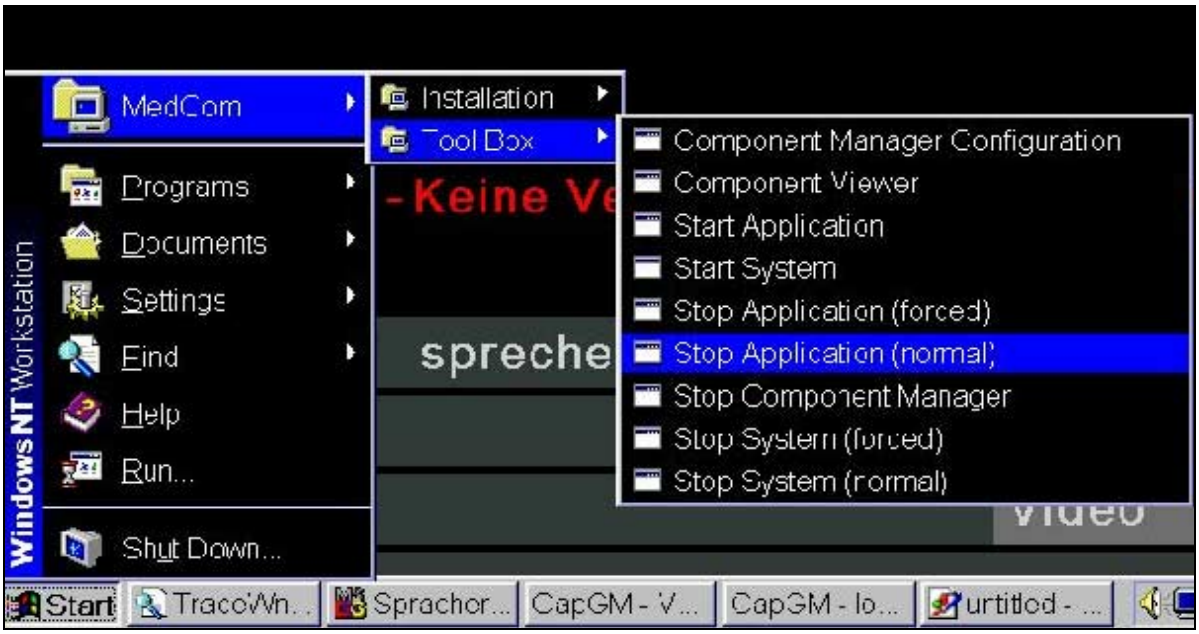

Fig. 18 Config Stop Application

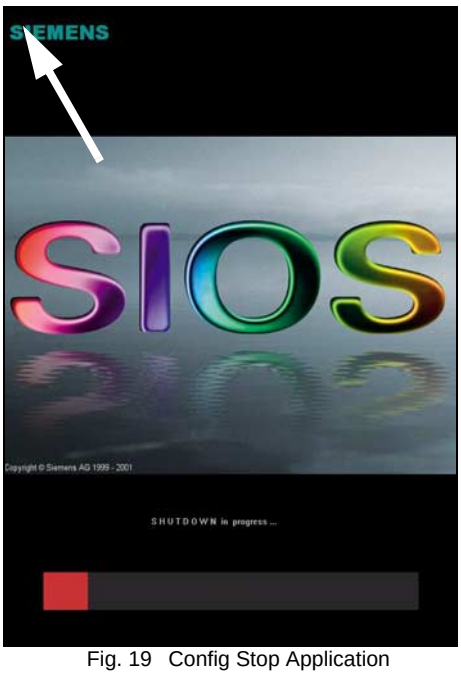

Fig. 19 Config Stop Application

- Double-click in the upper left corner of the "Shut down" window (just above the S of the Siemens logo).

- Press Ctrl+Esc to open the WINDOWS Start menu.
- SETTINGS \ CONTROL PANEL \REGIONAL SETTINGS
- Select language under REGIONAL SETTINGS PROPERTIES \ "INPUT LOCALES" task card.
- Select "Set as Default" and confirm with "OK."
- Open EXPLORER and select the appropriate file:

Path for German settings

C:\MEDSP\IOS\DATA\REGISTRY\SIOS_VOI_ GERMAN.reg

Path for English settings

C:\MEDSP\IOS\DATA\REGISTRY\SIOS_VOI_EnglUS.reg

A message informs you that the entries have been made in the registry. Confirm with "OK" as necessary.

- Press Ctrl+Esc to open the WINDOWS Start menu.
- Restart SIOS via MEDCOM\TOOLBOX\START APPLICATION.
- Wait until full SIOS functionality has been restored at the menu monitor.

Telephone configuration

Select "Service," "Activate service" and enter Password1.

- Select "phone" task card.
- Select "phoneservice enabled" checkbox.
- Select "allow incoming calls" checkbox.
- Enter number of acoustic signals (5 "Rings before Autoanswer").
- Select Name 1 in "Select or Move Phone." Enter "Name" and "Number" on the right.
- Click "apply" to save each name / number combination.
- Configure any additional telephone connections accordingly.
- For external phone numbers, enter the access number, area code, and number without spaces.
- Dialing pauses have to be entered using commas (1x , = 2sec).
- For older telephone systems, a flash button can be programmed using an exclamation mark (! = 70 msec).
- "Name 20" is entered as "Siemens SIOS Service" with the phone number of the responsible USC.
- Close the window by clicking "OK."

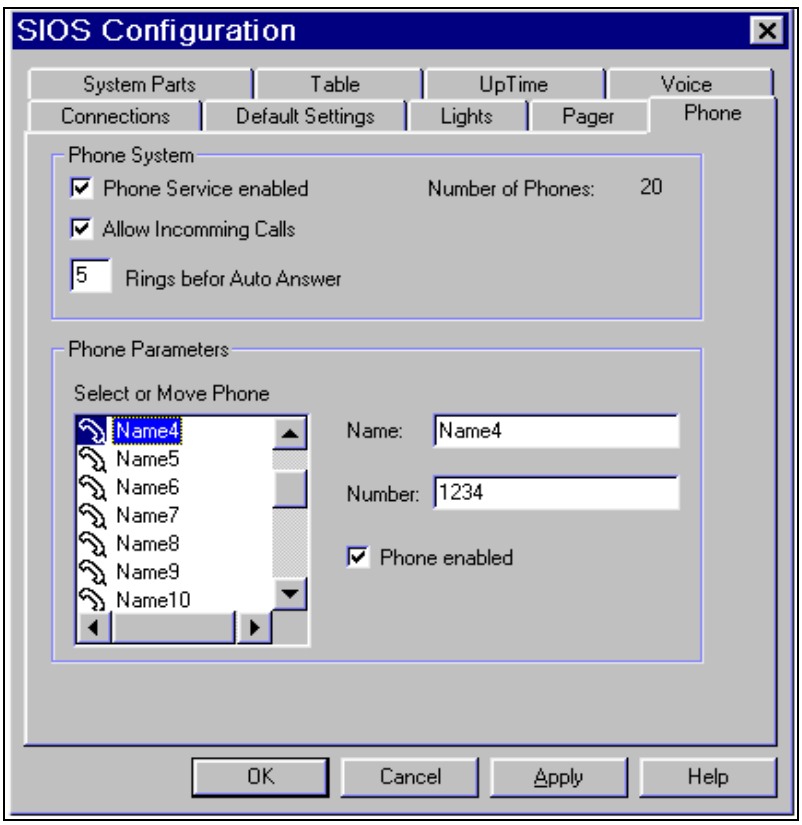

Fig. 20 Telephone configuration

Pager configuration

Select "Service," "Activate service" and enter Password1.

- Select "Pager" task card.
- Select "Pager service enabled" checkbox.
- Select the system used from the "Pager system" list.
- Enter the access number. Dialing pauses are programmed as explained in the telephone configuration section.
- Click "Name 1" under "Select or Move Pager." Enter name and number.
- Under "Message," enter the message as requested by the customer (some systems may only support transmission of numeric messages).
- Select "Add to emergency call" checkbox if requested by the customer.
- Click "apply" to save name / number combination.
- Configure any additional pagers accordingly and save each one by clicking "apply."

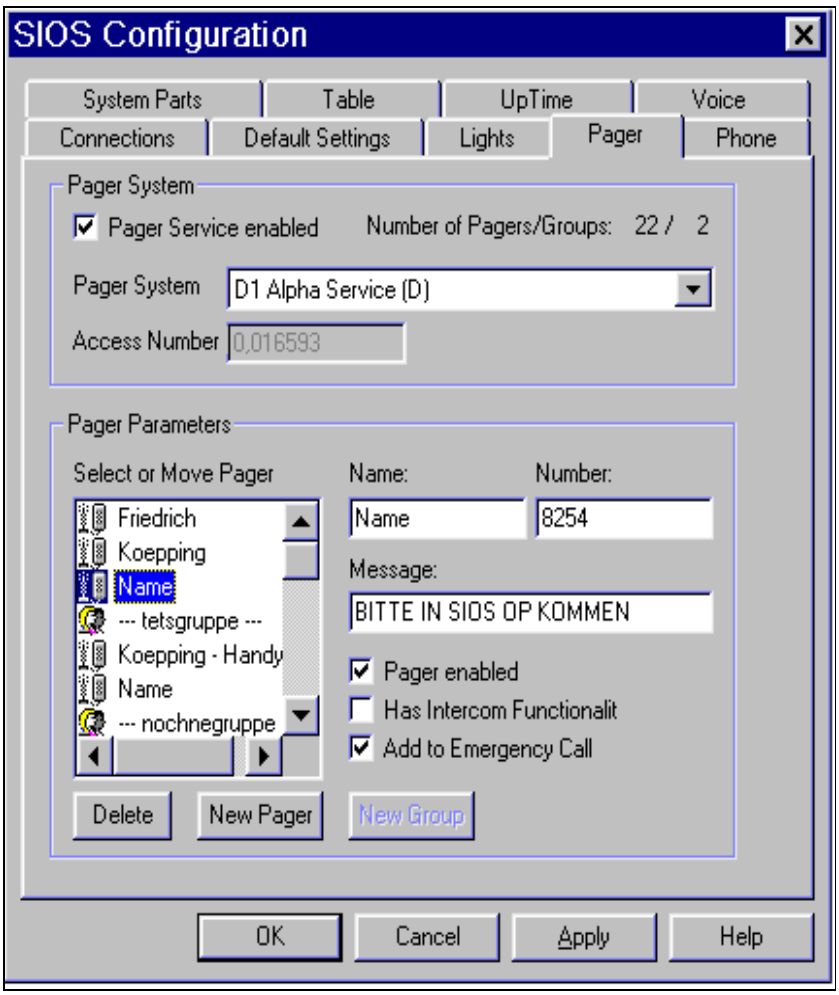

Fig. 21 Pager configuration

Voice control configuration

Select "Service," "Activate service" and enter Password1.

- Select "Voice" task card.
- Select "Voicecontrol enable/disable" checkbox.
- Confirm configuration with "OK."

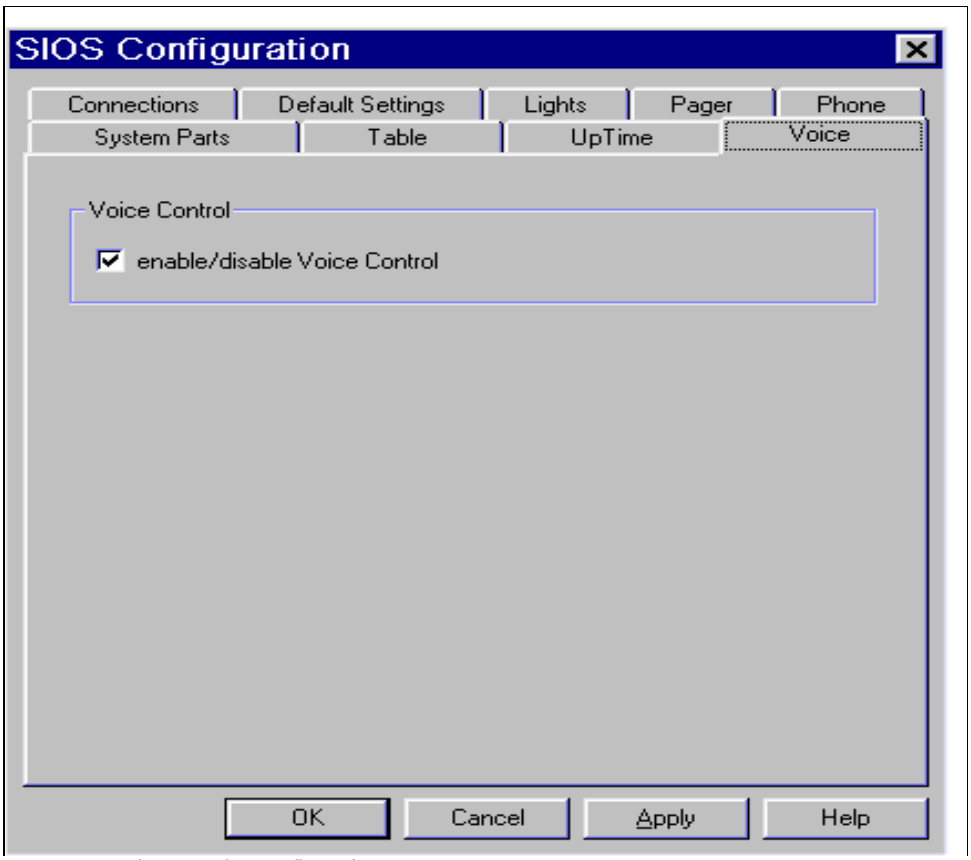

Fig. 22 Voice configuration

OR table(s) configuration

Determine the infrared table code(s) (typically indicated on a label attached to the table base or on the table remote control).

For systems with stationary column, this is the only table to be configured.

Mobile tables are configured separately.

Select "Service," "Activate service" and enter Password1.

- Select "Table" task card / "List of existing Tables" / "New" (Add Table is activated).
- Click "Delete Table" to delete any preconfigured tables.
- Select the appropriate table type from the "Producer" list.
- Set the IR code using the Tableaddress (ignore 0x - e.g., model plate: Maquet 1130 / label on table: Ir 4f - setting 0x4f).
- The IR code can be set using the mouse or the arrow buttons.
- Click "Add Table" and save by clicking "Apply" (if the "IR-Code already exists, Overwrite?" message is displayed, confirm with "Yes").
- Table name and IR code are displayed in the "List of existing Tables."
- Repeat these steps to add any additional tables to the list.

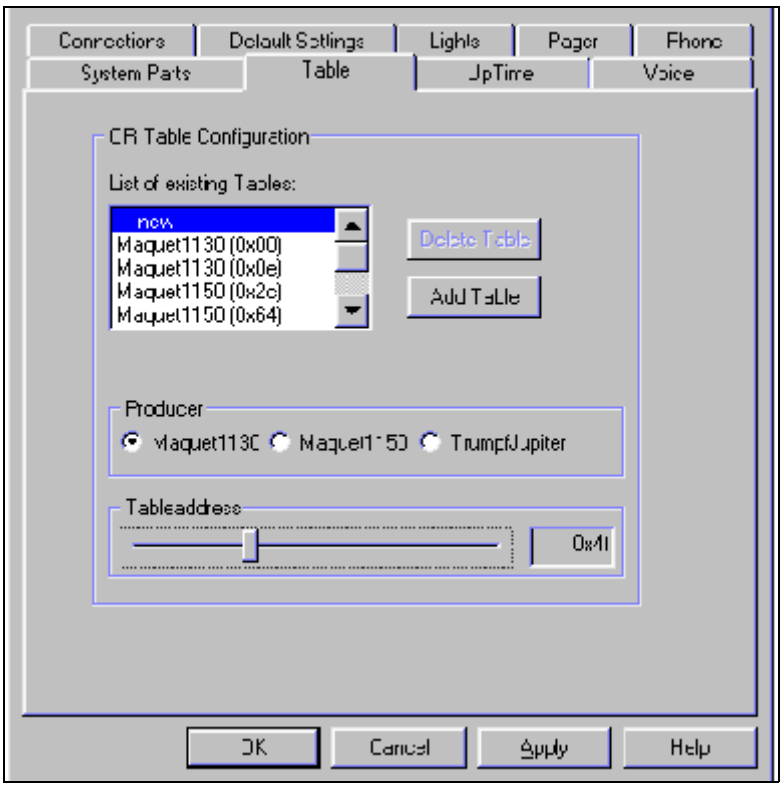

Fig. 23 Table configuration

Roomlight / OR light configuration

Select "Service," "Activate service" and enter Password1.

- Select "Lights" task card.
- Perform configuration for roomlight, OR light, and dimmer.
- Click "apply" when configuration is completed.

Preconfiguration example: the maximum configuration is shown below.

Two controlled OR light units, the first one with dimmer function. Three roomlights, the first one with dimmer function.

Depending on the ambient conditions, select the number of controlled lights and check the options for the dimmer function.

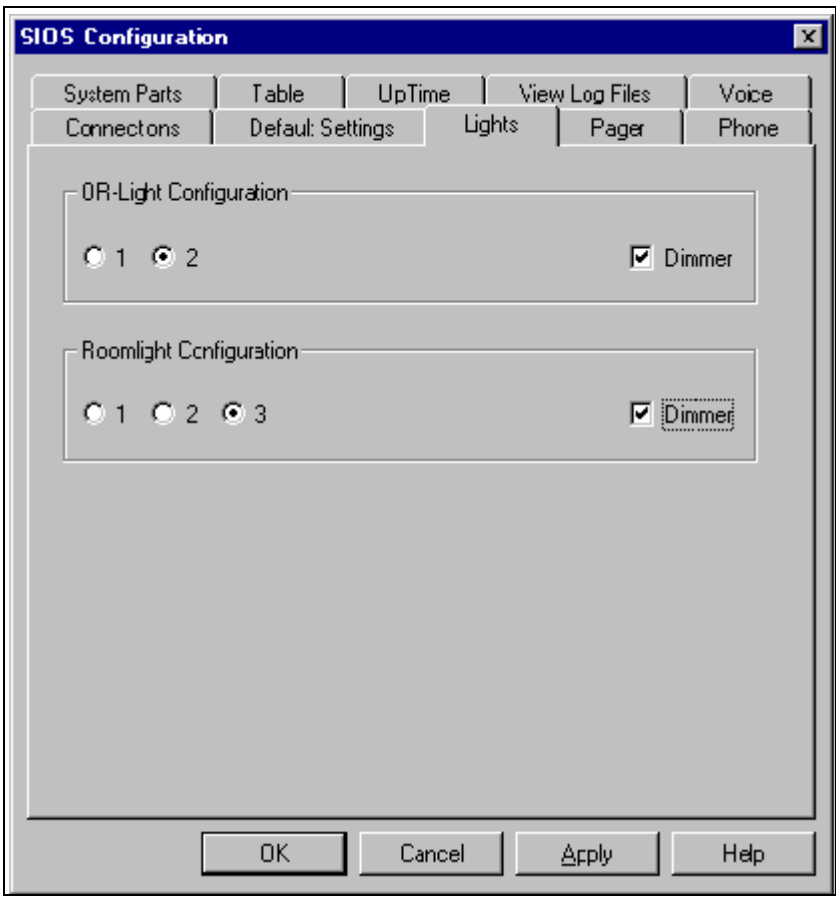

Fig. 24 Lighting configuration

Restart SIOS after making this change to activate all previous configurations.

Light control configuration (hardware)

By default, all functions are selected. The dimmer function always refers to the first light source displayed in the control menu.

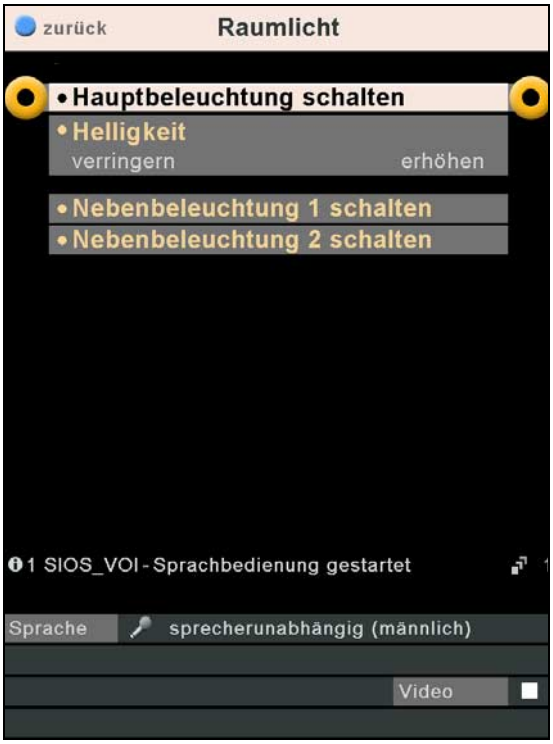

Fig. 25 Roomlight menu

Fig. 26 OR light menu

Perform all operating steps in the "Roomlight" and "OR light" menus using the HBT.

If all operating steps comply with the requirements, no further action is necessary. This completes the testing of the light control.

In case of discrepancies, the connections at the light control have to be switched to ensure that the menus displayed correspond to the respective light sources. Changes in the connections have to be reflected in the circuit diagram.

Checking menu functions

The first test is performed using the hand input device (HBT); for this purpose, deactivate voice control in the "Setup / Voice control" menu.

NOTE: The telephone and pager functions are excluded from this test because they require the assistance of another caller. This test is performed in one step at a later time using the HBT and voice control.

Select all connected devices using the HBT and perform operations according to the operating manual. Test all operating steps and controls of the respective component. System movements are indicated by acoustic signals (e.g., OR table or X-ray system).

NOTE: Only audio-visual tests are performed. The actual function of the IP devices is not tested. As a prerequisite, each device must have been previously started up in "stand-alone" mode by manufacturer-authorized personnel or already in use at the customer site.

SIOS start-up personnel may not perform work on the IP devices. Discrepancies during the testing procedures have to be recorded in the protocol. Troubleshooting and adjustments have to be performed cooperatively by manufacturer personnel (this includes Siemens X-ray and Ultrasound systems).

NOTE: The following menus are examples only. Depending on the components connected, the menu monitor display may vary.

The Info menu (blue button on HBT) lets you access help information regarding operation, warnings, and error messages.

Fig. 27 Main Menu & Settings Overview

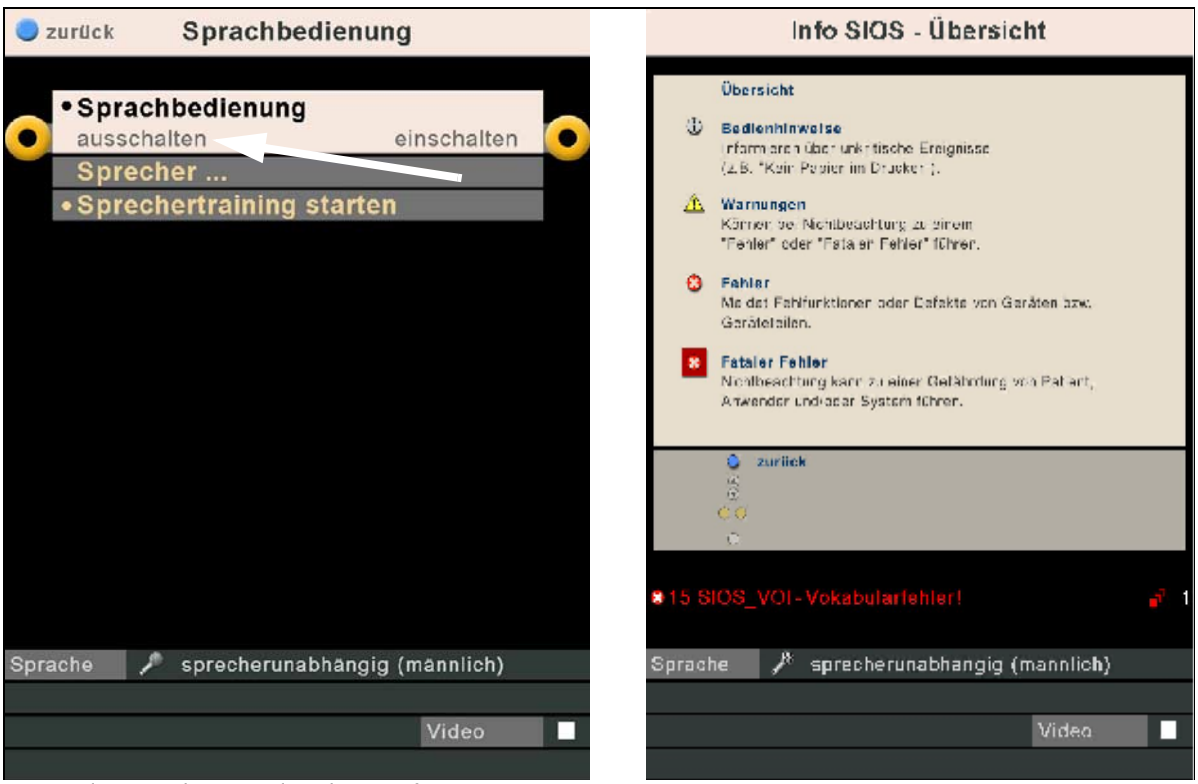

Fig. 28 Voice Control Settings & Info Menu

Videomixer

Test all menu items. The image system to be tested has to provide an image.

For example, if no X-ray or Ultrasound system is connected, the image monitor contains no image information (blue screen).

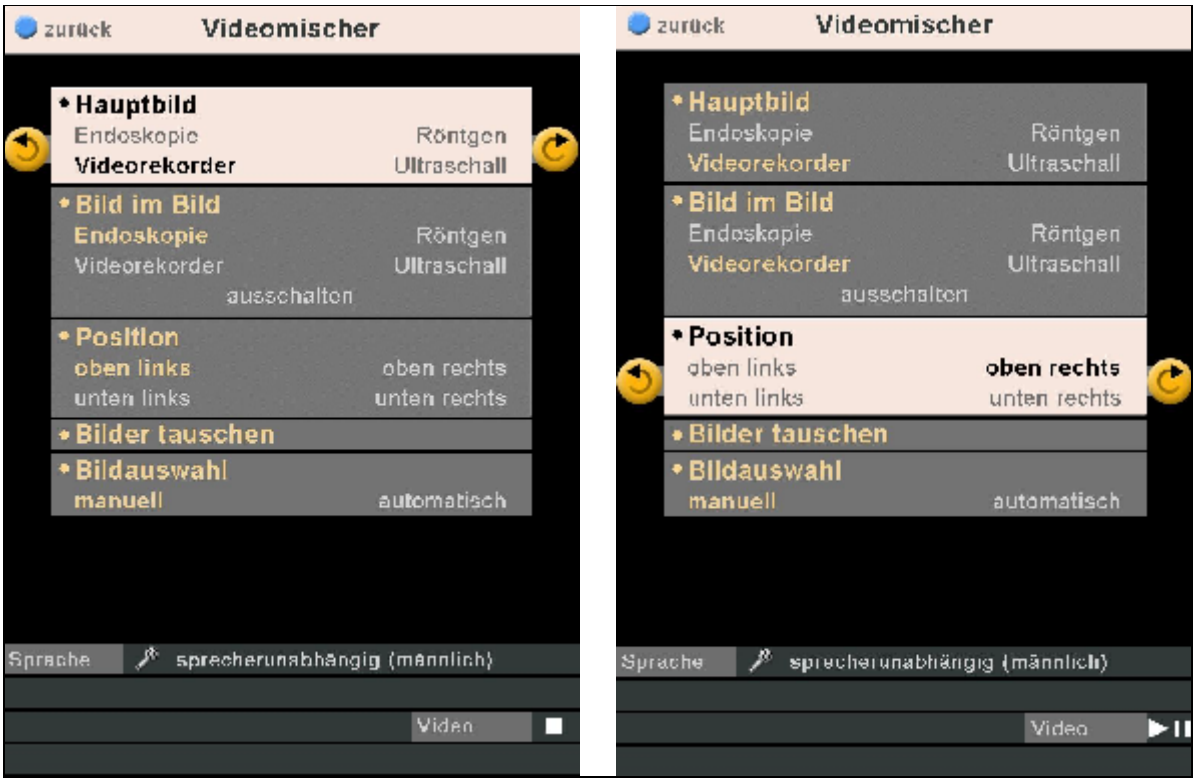

Fig. 29 Video Mixer Menu & Position Selection

Endo light (Wolf Co.)

Select endo light via menu control and test all operations. The corresponding function has to be triggered at the IP device.

Fig. 30 Endo Light Menu

Endo camera (Wolf Co.)

Select endo camera via menu control and test all operations. The corresponding function has to be triggered at the IP device.

Fig. 31 Endo Camera Menu

ESU (Berchtold Co.)

Select ESU via menu control and test all operations. The corresponding function has to be triggered at the IP device. Specific information is displayed in the status line at the SIOS control monitor.

Fig. 32 ESU Menu & Tripolar Follow-Up Menu

NOTE: Certain operations may trigger error messages if no patient applicators are connected to the ESU. You can confirm these messages; they are not relevant for testing purposes.

OR table (Trumpf Jupiter Co.)

Test all movements of screen pages 1 and 2.

Fig. 33 Table Menu Page 1 & Menu Page 2

Next, test table selection on page 2.

If mobile tables are used, activate another type under "Table selection" and test all movements. Test the full functionality of at least one other table. The table tested first remains in the room and must not react to any SIOS operations.

X-ray system (Siemens Siremobil ISO-C)

Select Main Picture X-ray in Videomixer menu. If available, select X-ray images from the image archive.

Select and test all functions in the X-ray menu. The status line displays specific information. Changes resulting from system operations have to be indicated at the control monitor and X-ray system. Information missing from the status line is displayed at the X-ray system. Image display functions have to be indicated at the SIOS image monitor and the monitor of the X-ray system.

NOTE: No radiation is released.

Fig. 34 X-ray Menus & Positioning

Ultrasound system (Siemens Sonoline Sienna)

Select Main Picture Ultrasound in Videomixer menu. If available, select Ultrasound images from the image archive.

Select and test all functions in the Ultrasound menu. Changes resulting from system operations have to be indicated at the SIOS image monitor and Ultrasound system.

Fig. 35 Ultrasound Menus

Video recorder

Test all functions using the VHS test cassette. The symbol of the function selected has to be displayed in the status line.

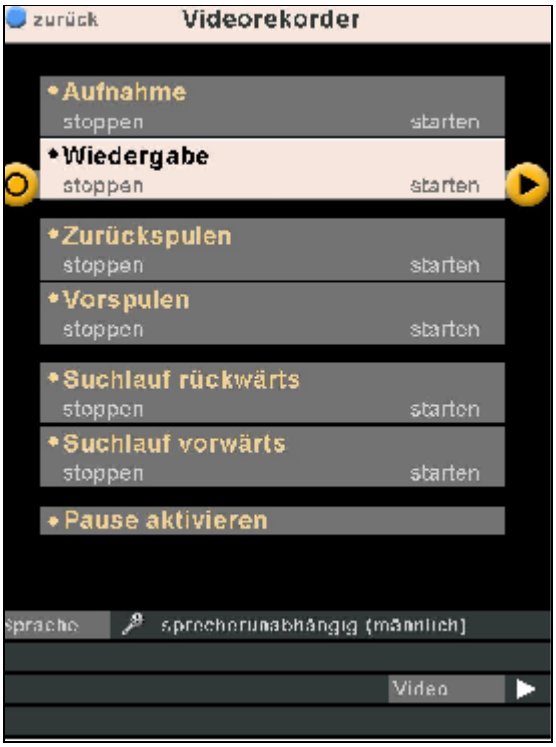

Fig. 36 Video recorder menu

NOTICE	**If no endo camera is available in the device box, the VCR in the device box is used instead. Connect the VCR using the power supply cable and video signal cable of the endo camera only. Play the test cassette and select the Main Picture Endo Camera via the video mixer.**

Video printer

Print any image from the image monitor on the printer by pressing the white button on the HBT twice in quick succession. The information line should return a message.

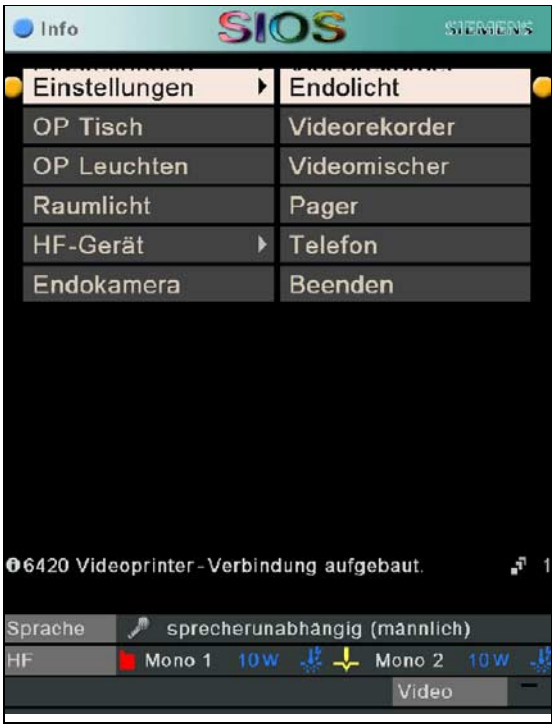

Fig. 37 Info line "Video Printer"

Testing the voice control

- Put on headset and position microphone. Perform test wearing the type of face mask used in this particular OR area.
- Select "Setup/Voice control."
- Use the HBT according to the operating manual to perform all operations as before. All executable voice commands can be identified by a dot at the menu monitor (except main menu).
- Read and clearly pronounce the commands selected on the menu monitor. Include a short, distinctive pause between all words (< 2sec). Hyphenated words are pronounced as one word.
- If the command is recognized, the menu should respond in the same way as if using the HBT. Repeat the command if it is not recognized at the first attempt. The success rate for voice command recognition needs to be approx. 90% (9 out of 10 different spoken commands have to be recognized at the first attempt).
- Start voice training and follow the prompts on the menu monitor.
- Complete voice training once using the "Service" speaker name. Save this speaker in the system for future maintenance and service procedures. In addition, save the "Service" voice training to a 250 MB ZIP disk.

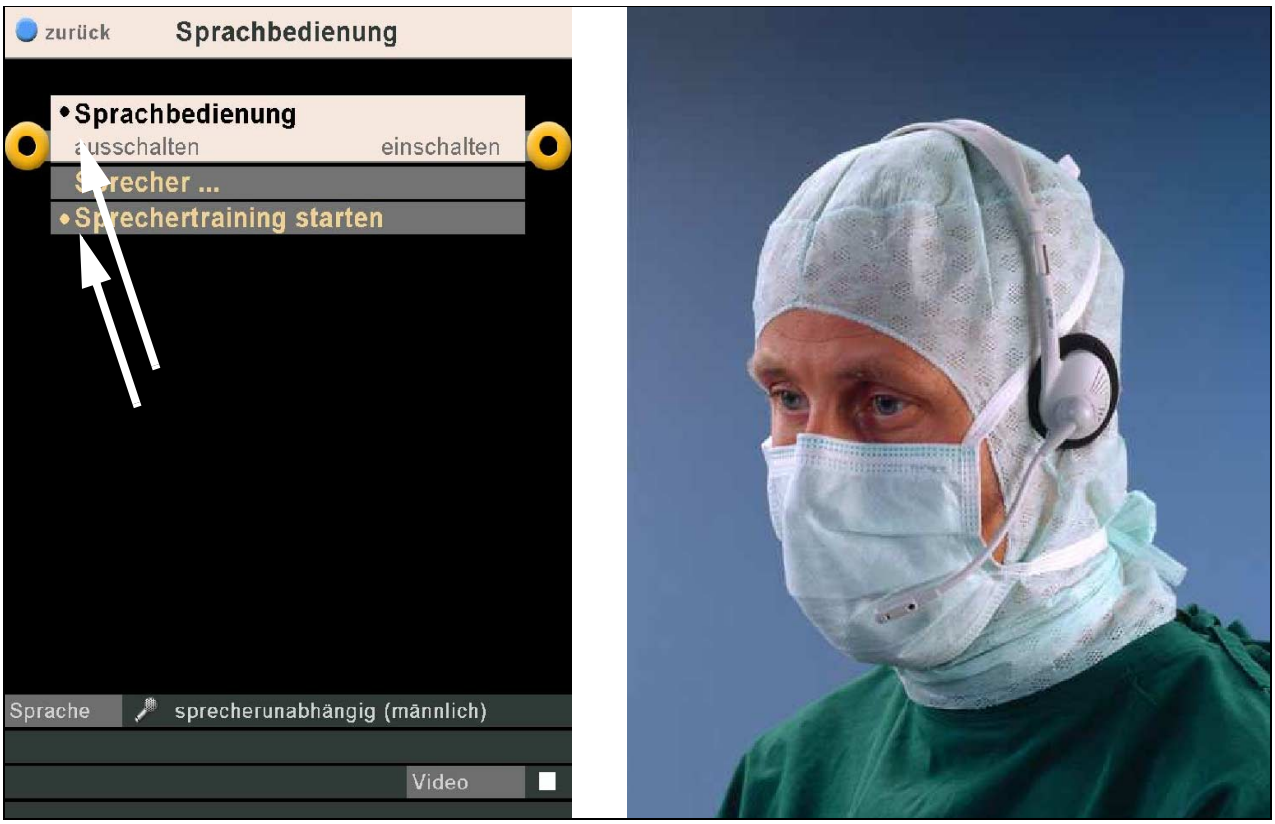

Fig. 38 Dot indicators for voice control & headset use

NOTE: The assistance of another caller is required for the following telephone and pager tests. As a result, perform all functions in one step using the HBT and voice control.

Telephone

The following tests require the headset, one external and one internal telephone, as well as the assistance of another caller. Perform all operating steps once using the HBT and once using voice control.

- Deactivate hands-free feature (if available)
- Deactivate call blocking under "Setup / Telephone."
- Establish test connection under "Telephone / Call ....."
- Adjust volume and microphone levels.
- Terminate each call using "End call."
- Perform the same test using an internal connection.
- Have both phones call the SIOS.
- Accept call and adjust volume and microphone levels.
- Decline call; the caller should hear an automated message from the modem (no mailbox function).
- Activate call blocking under "Setup / Telephone." The caller should hear an automated message from the modem (no mailbox function).

Fig. 39 Setup & Telephone Menu

The user can make changes in the telephone menu (refer to the operating manual). Select "Settings," "Service," "Activate service" without a password and select the "Phone" task card. The user can change the calling number, name, and sequence.

Pager

Check all menu functions (pager system in "Pager" task card enabled).

NOTE: If an emergency call is to be programmed, a test is required. Inform all participants beforehand that this is a test only.

Perform all operating steps once using the HBT and once using voice control.

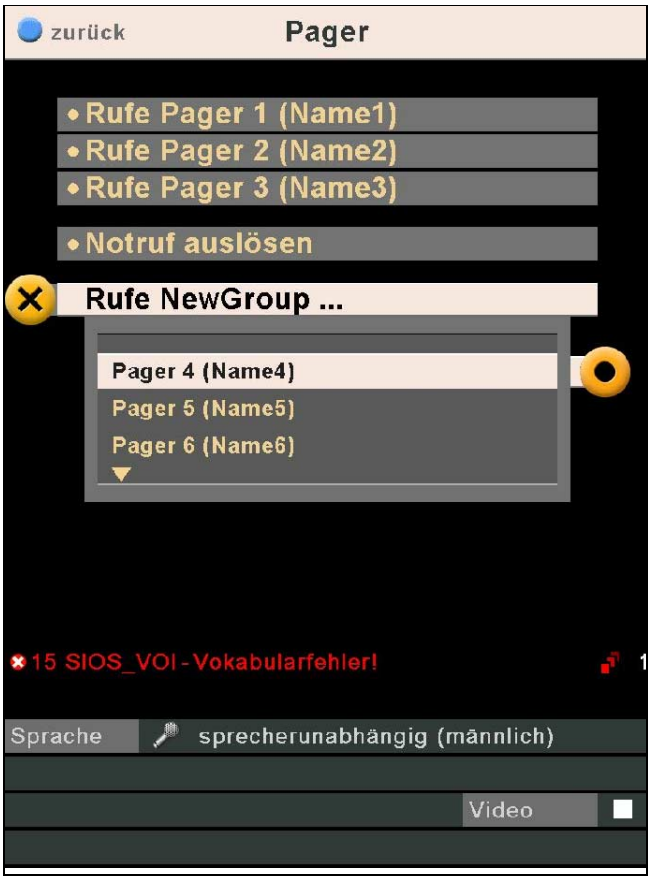

Fig. 40 Pager Menu

The user can make changes in the pager menu (refer to the operating manual). Select "Settings," "Service," "Activate service" without a password and select the "Pager" task card. The user can change the calling number, name, sequence, groups, and message text.

Changes to telephone and pager settings will become effective after a SIOS restart.

Creating a backup disk

After the initial start-up has been completed, the system configuration data have to be backed up. Save the backup to a 250 MB ZIP disk and store in the designated compartment (electronics cabinet, inside door, bottom section).

The following data have to be backed up:

- All ccf files (user interface)
- Part of the registry (configuration)
- Hardware configuration
- Speaker data

Prerequisite:

- The "ClearKey" has been deactivated in the Service menu
- The ZIP drive contains a disk

The structure for data backup, service, and maintenance has to be created

on the ZIP disk (see Fig. 2):

- "SIOS_SerialNumber\Konfig_01" Archiving of initial start-up.
- "Updates\Backup" Backup copy for service and maintenance.
- "Updates\Infos" All system-specific service information.

Structure of ZIP disk:

Edit the 5 folders "SIOS_Ser.No."/"Konfig_01" and "Updates"/ "Backup"/ "Infos" manually.

The "ccf" and "hs_user" folders are created using Copy & Paste.

Creating the backup

- Press Ctrl+Esc to open Explorer.

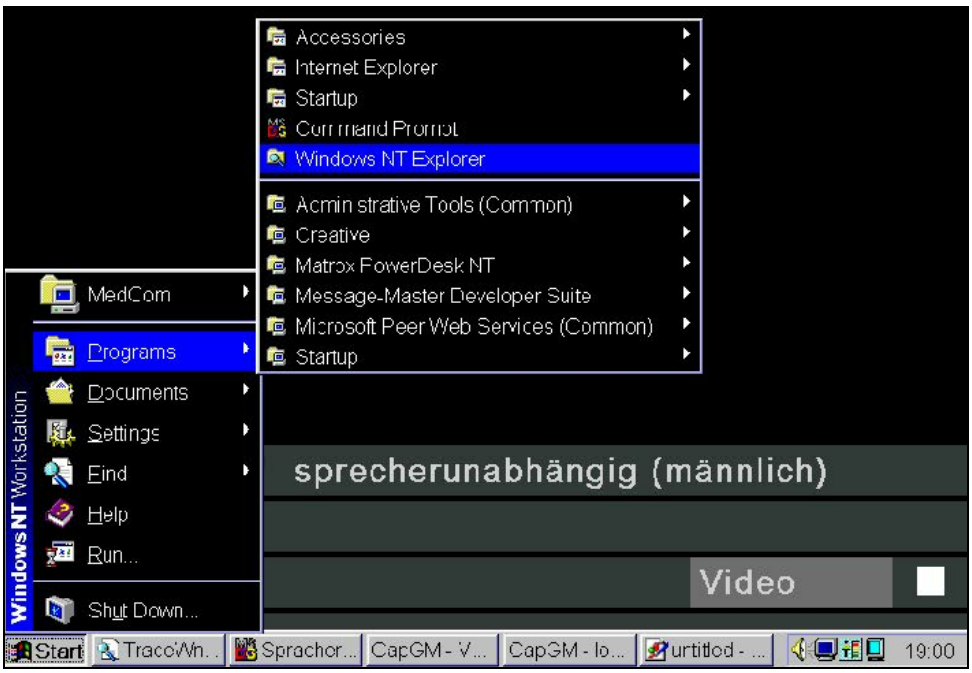

Fig. 1 Opening Explorer

- Select external drive "Zip250" in Explorer.
- Create structure on ZIP disk.
- Right-click in the right area of Explorer and select "New" / "Folder."
- Create the structure for the 5 folders as shown and edit the names.

"SIOS_SerNo." \ "Konfig_01" - - - and ---- "Updates" \ "Backup" \ "Infos"

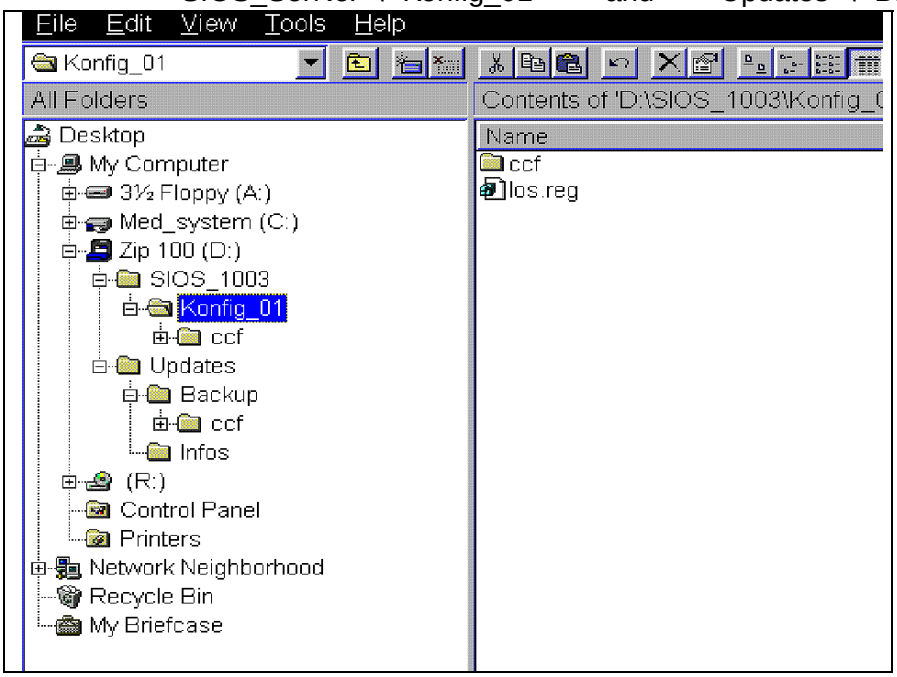

Fig. 2 ZIP backup structure

Saving control menus (ccf files)

- Select C: MedSp\Ios\Data\ ccf.
- Command line "edit" / "copy" (copy ccf folder).

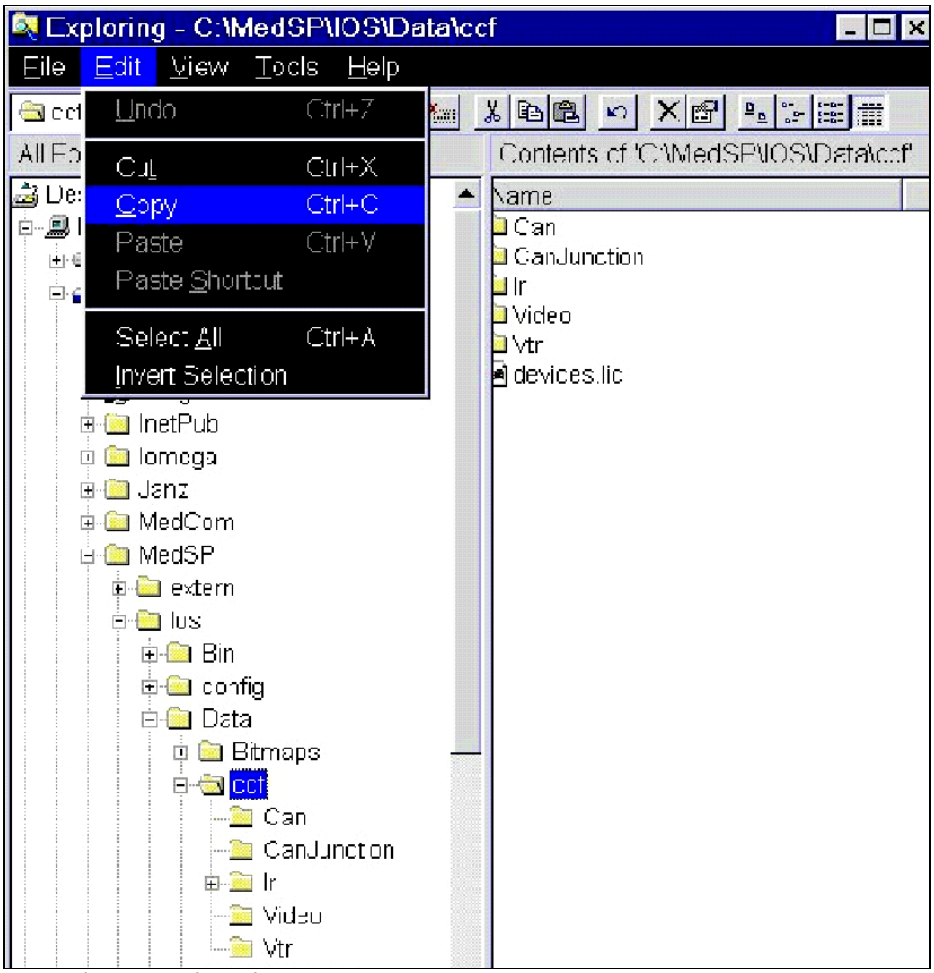

Fig. 3 Copying ccf

- Select external drive folder "SIOS_100X\Konfig_01."
- Select "edit" "paste" to copy the "ccf" folder to disk.
- Select "edit" "paste" to copy the "ccf" folder to "Updates\Backup."

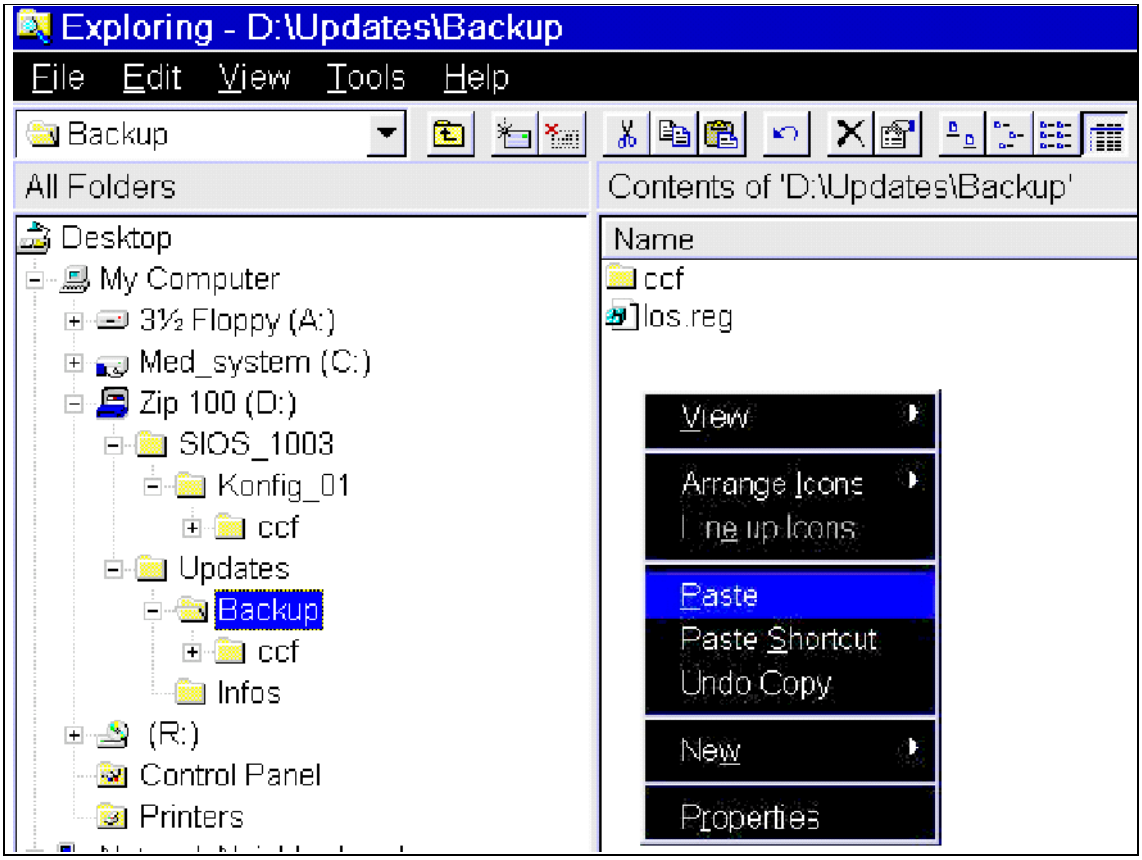

Fig. 4 Pasting ccf

Saving the software configuration (registry)

Step 1:

- Press Ctrl+Esc to open the Start menu.
- Select "Run," enter "regedit," and confirm with "OK."

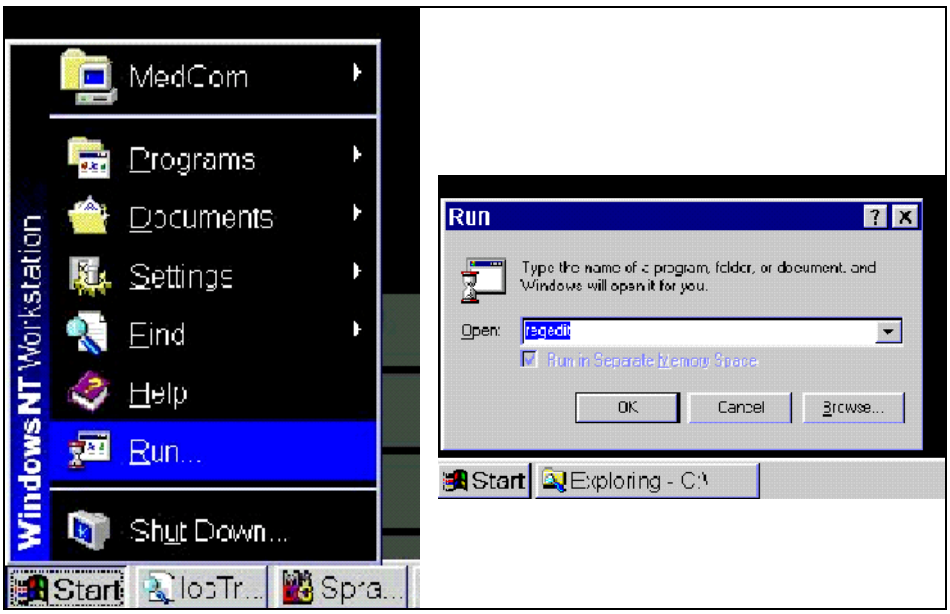

Fig. 5 Start & Run

Step 2:

- Select "HKEY_LOCAL_MACHINE\SOFTWARE\Siemens\IOS".
- Select "Registry" "ExportRegistryFile" command line.

NOTICE	**"Selected branch" has to be selected in this window!**

- Export to "SIOS_Ser.No.\Konfig_01" folder on the ZIP drive.
- Export to "Updates\Backup" folder on the ZIP drive.

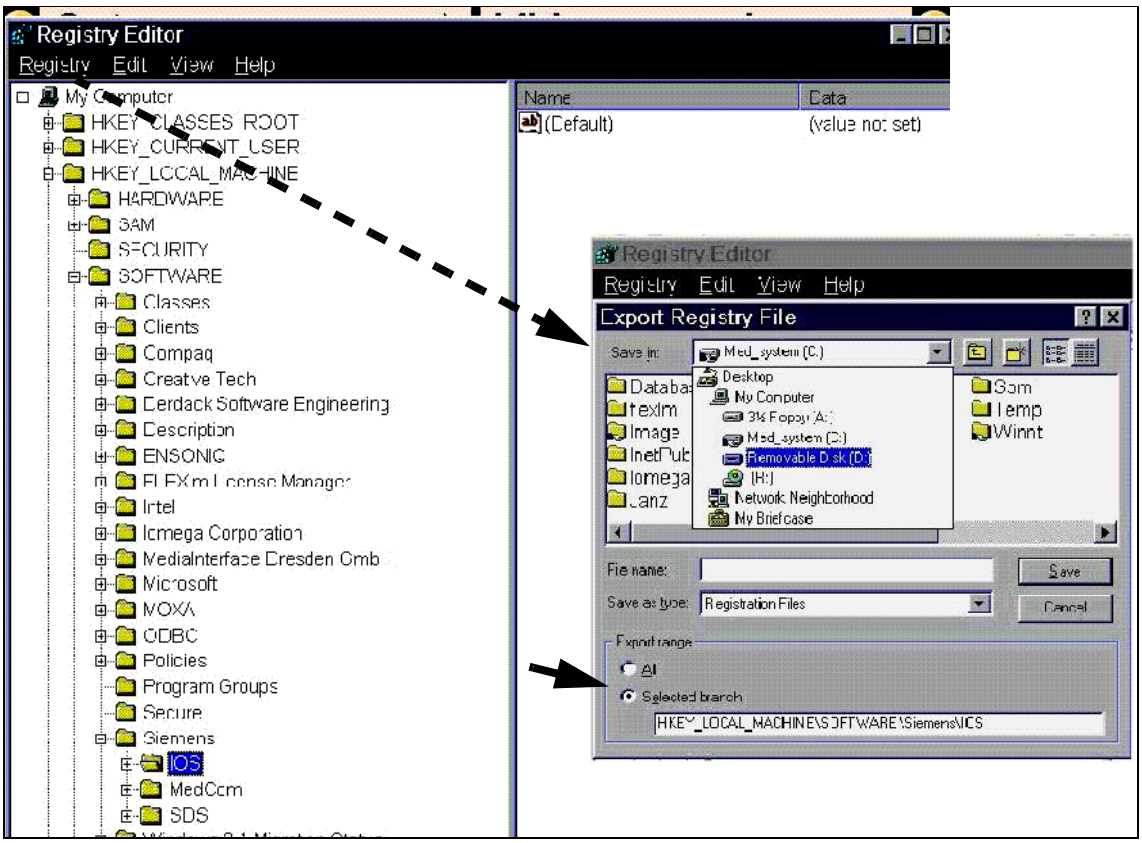

Fig. 6 HKEY_LOCAL_MACHINE\SOFTWARE\Siemens\IOS - export to disk

Saving speaker data

- Open Explorer.
- Select C:\SBM\SDSData\hs_user path.
- Select "Copy" to copy the folder.
- Select "Paste" to copy to \ SIOS_SerNo\Konfig_01 on the ZIP backup disk.
- Save another copy to \Updates\Backup on the ZIP backup disk.

Saving the hardware configuration

- Open Explorer and navigate to the following path:
  "C:MedSP\Service\Konfig\Example_Konfig.txt"
- Select "save as" to rename the file **"Hardware_Konfig.txt"** and save it in:
  "C:MedSP\Service\Konfig".
- Click "Yes" when prompted to overwrite the existing file.
- Enter the following data or overwrite the examples in the "Hardware_Konfig.txt" file:
- Serial number, standard system
- Abbreviation, installation site
- Date of initial start-up
- Serial number of components according to installation protocol
- Modem and keyboard, country-specific information
- SIOS options incl. manufacturer, type, and serial number
- Name of responsible start-up engineer / date

If available, the following data are recorded as well:

- Industry partner systems incl. manufacturer, type, and serial number
- Interface activation / assignment

If a component listed is not available, the corresponding line is deleted.
Information that is unavailable or not relevant is labeled n/a.

- Save the file.
- Copy the file to the backup disk under "Konfig_01" and "Updates/Backup".

Label the ZIP disk including SIOS Ser.No. / Backup / Month / Year /

The disk is stored in the secure compartment of the electronics cabinet (inside door, lower section).

Fig. 7 ZIP disk

Data security:

To facilitate start-up, maintenance, and/or service procedures, data can be saved to a separate ZIP disk.

NOTE:

All copies are intended for single use during necessary work procedures and have to be deleted afterwards.

Records containing confidential information such as patient, customer, or system data are prohibited.

Unauthorized transfer to third parties is prohibited.

Supporting data required outside the system site have to be protected against unauthorized access.

Disk protection

ZIP disks easily accessible at the system site have to be read and write-protected.

Data transfer

If multiple systems are started up in a connected OR area, the first SIOS is used as the "Master." The basic configuration of the first backup disk is copied to a separate ZIP disk and used for the other systems.

This includes pager selection, pager list, telephone selection, telephone list, mobile OR tables, speaker data etc.

These settings can be modified as required for each of the other rooms.

NOTE:

One complete backup disk each has to be created per system according to the serial number and stored in the electronics cabinet of the respective system.

Activating ClearKey

Before making the system available to the user, this function has to be reactivated.

- Select "Activate service" under "Settings/Service" and enter Password 1.
- Select "System Parts" task card.
- Select "Security Page" and enter Password 2.
- Select "Set/Clear Key Intercept Flag" checkbox.
- Click the "Close" box to close the Security window.
- Click "Apply" in the System Parts window.
- Close all task cards and return to the SIOS main menu interface.

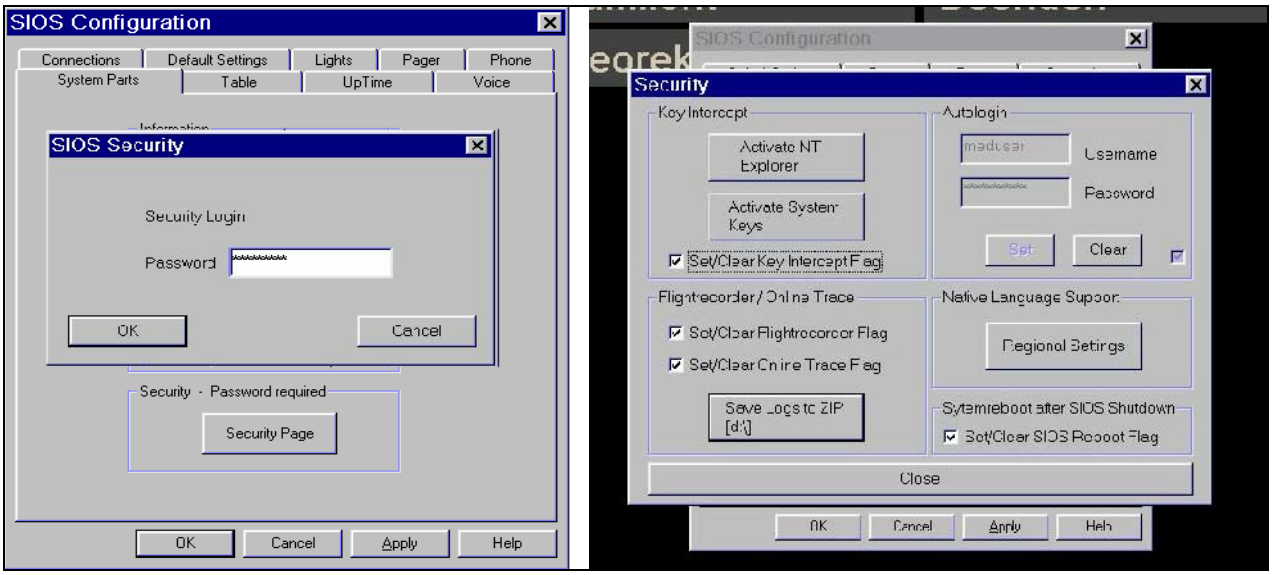

Fig. 1 Activating ClearKey

- Select "Exit" menu and restart the system using "Exit SIOS," "Restart."

EMERGENCY STOP test

Activate the EMERGENCY STOP switch at the grip module below the menu monitor (infrared booster below the device box deactivated). Try to operate the OR table from the SIOS.

Table operation should be disabled, and an error message is displayed at the menu monitor.

Operate the table using the manufacturer controls. Table operation should respond properly.

Release the EMERGENCY STOP switch and wait for the logon information at the menu monitor

(approx. 30 sec); the table should once again respond to the SIOS controls.

UPS test

During normal operation, switch off fuse F1 / PSU and switch it back on (simulating power failure).

The PC including menu monitor and all supply components remain functional for at least 80 sec via the UPS. An error message is displayed at the menu monitor.

Press the green SIOS On switch at the electronics cabinet. Normal operation should be fully restored.

EMERGENCY OFF test

- Activate the EMERGENCY OFF switch at the electronics cabinet. With few exceptions, all components are switched off by SIOS. The image monitor, documentation unit, and surgical devices in the device box remain in operation.
- Release the EMERGENCY OFF switch.
- Restart by pressing the green SIOS On button.
- Wait until the start-up is completed.
- The control menu may be displayed incorrectly.
- In this case, select "Exit" to execute a regular "Exit SIOS" operation.
- Wait until the system has completely shut down and restart SIOS.
- After the start-up is completed, normal operation has to be restored.

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Basic settings for TFT image monitors

As a general rule, SIOS image monitors are not used for diagnostics. Their only purpose is to provide information and monitoring support. No standardized image quality test is necessary.

The basic settings for contrast, brightness, and colors need to be adjusted for all image monitors according to manufacturer instructions (4 configuration buttons on front panel of monitor). Check for missing pixels by displaying a dark image on screen (monitor off/on). The monitor has to be replaced if missing pixels are detected during initial start-up.

Fig. 1 Image monitor, missing pixels

Users should be familiar with the manufacturer instructions to be able to adjust the basic settings as necessary.

TFT menu monitor settings

The menu monitor is used to provide information only. The basic settings need to be adjusted according to manufacturer instructions (4 configuration buttons at the back side of the monitor).

Check for missing pixels by displaying a dark image on screen (monitor off/on). The monitor has to be replaced if missing pixels are detected during initial start-up.

Fig. 2 Menu monitor, missing pixels

Mechanical check

All covers have to be installed completely, SIOS has to be switched on, and all components have to be logged on. For the following tests, all components have to remain stable (no cable or interface damage).

Test all rotation and lift/lower movements of the support arms, MTS, and monitors. Check ease of movement, end stops, and random stop positions. All defined stop positions have to be maintained without unintentional movement.

Approach the park and work positions of the device box. Check ease of movement, end stops, and random stop positions. All defined stop positions have to be maintained without unintentional movement of the ceiling-mounted support arms.

Visual inspection

Inspect the complete system for contamination.

Protective conductor measurement

Repeat protective conductor measurement according to ARTD Part 2 (chapter 4 in this manual).

Protocol

Complete the start-up protocol and have it signed by the designated persons.

This confirms that start-up has been completed successfully. The master copy of the protocol is kept in the system folder at the customer site; copies have to be sent to the addresses listed in the protocol.

System acceptance

The responsible start-up engineer should be present at the time of system acceptance and training. This ensures that individual configurations can be coordinated and implemented immediately.

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